9-1340-222-20

TECHNICAL MANUAL

ORGANIZATIONAL MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)

2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 66-MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS; AND M3A2E1 ROCKET MOTOR (JATO)

This copy is a reprint which includes current pages from Changes 1 through 8.

HEADQUARTERS, DEPARTMENT OF THE ARMY
JUNE 1973

D 101.11:

WARNING

Do not drop, slide, tumble, or handle rockets in any manner which might damage the motor tube and fins or otherwise render the rocket susceptible to malfunction.

Do not expose rockets to extreme, rapid, and recurrent variations in temperature.

To prevent explosion, do not expose rockets or launchers loaded with rockets to the exhaust from jet engine starter pods or gas turbine compressors.

Change
No. 8

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, *30 September 1987*

Unit Maintenance Manual
(Including Repair Parts and Special Tools List)
2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS,
2.75-INCH SPIN STABILIZED, WRAP AROUND FIN AIRCRAFT ROCKETS
66 MM LIGHT ANTITANK WEAPON SYSTEMS,
3.5-INCH ROCKETS
(NSN 1340-01-026-1730)
AND
M3A2E1 ROCKET MOTOR (JATO)

TM 9-1340-222-20, 13 June 1973, is changed as follows:

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Remove pages	Insert pages
A	A
i and ii	i and ii
2-3 thru 2-6	2-3 thru 2-6.1 (2-6.2 blank)
2-7 and 2-8	2-7 and 2-8
3-13 and 3-14	3-13 and 3-14
3-17 thru 3-20	3-17 thru 3-20
D-1 thru D-4	D-1 thru D-4

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To be distributed in accordance with DA Form 12-40A-R, Unit requirements for Small Rockets and Missiles.

CHANGE
No. 7

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 30 August 1985

Organizational Maintenance Manual
(Including Repair Parts and Special Tools Lists)
2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS;
2.75—INCH SPIN STABILIZED, WRAP AROUND FIN AIRCRAFT ROCKETS
66MM LIGHT ANTITANK WEAPON SYSTEMS;
3.5-INCH ROCKETS
(NSN 1340-01-026-1730)
AND
M3A2E1 ROCKET MOTOR (JATO)

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2-7 and 2-8	2-7 and 2-8
D-3 and D-4	D-3 and D-4

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CHANGE
No. 6

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, February 1984

Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists) 2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 66-MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS (NSN 1340-01-026-1730) AND M3A2E1 ROCKET MOTOR (JATO)

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D-3 and D-4	D-3 and D-4

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No. 5

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Organizational Maintenance Manual
(Including Repair Parts and Special Tools Lists)
2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS;
66MM LIGHT ANTITANK WEAPON SYSTEMS;
3.5-INCH ROCKETS
(NSN 1340-01-026-1730)
AND
M3A2E1 ROCKET MOTOR (JATO)

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D-3 and D-4	D-3 and D-4

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DEPARTMENT OF THE ARMY
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Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists) 2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 66-MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS (NSN 1340-01-026-1730) AND M3A2E1 ROCKET MOTOR (JATO)

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(Including Repair Parts and Special Tools Lists)
2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 66-MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS (NSN 1340-01-026-1730) AND M3A2E1 ROCKET MOTOR (JATO)

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C-1 and C-2	C-1 and C-2
D-1 through D-4	D-1 through D-4

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TM 9-1340-222-20
C2

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No. 2

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DEPARTMENT OF THE ARMY
WASHINGTON, DC, *25 June 1979*

Organizational Maintenance Manual
(Including Repair Parts and Special Tools Lists)

2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 66-MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS (NSN 1340-01-026-1730) AND M3A2E1 ROCKET MOTOR (JATO)

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Organizational Maintenance Manual (Including Repair Parts and Special Tools Lists) 2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS; 66-MM LIGHT ANTITANK WEAPON SYSTEMS; 3.5-INCH ROCKETS, AND M3A2E1 ROCKET MOTOR (JATO)

TM 9-1430-222-20, 13 June 1973, is changed as follows:

Page i. The supersession note should read, "This manual supersedes TM 9-1340-201, April 1971 and together with TM 9-1340-214-10, 1 October 1973, supersedes TM 9-1340-214-12, 7 January 1969.

1. Remove old pages and insert new pages as indicated below. New or changed material is indicated by a vertical bar in the margin of the page.

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Technical Manual
No. 9-1340-222-20

*TM 9-1340-222-20

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 13 June 1973

UNIT MAINTENANCE MANUAL
(INCLUDING REPAIR PARTS AND SPECIAL TOOLS LISTS)
2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS
2.75-INCH SPIN STABILIZED, WRAP AROUND FIN AIRCRAFT ROCKETS
66MM LIGHT ANTITANK WEAPON SYSTEMS
3.5-INCH ROCKETS,
AND
M3A2E1 ROCKET MOTOR (JATO)

REPORTING OF ERRORS

You can improve this manual. If you find any mistakes or know of a way to improve the procedures, please let us know. Mail your DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to Commander, U.S. Army Armament, Munitions and Chemical Command ATTN: AMSMC-MAY-T(D), Dover, NJ 07801-5001. A reply will be furnished to you.

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* This manual supersedes TM 9-1340-201, 19 April 1971 and together with TM 9-1340-214-10, 1 October 1973, supersedes TM 9-1340-214-12, 7 January 1969., including all changes.

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CHAPTER 1
INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This is one of a series of technical manuals on servicing and maintenance of rockets, rocket motors (JATO's), and rocket weapon systems. The information in this manual is limited to that required by organizational maintenance personnel.

b. The following maintenance manuals are listed:

(1) Operating instructions and operator-level maintenance are covered in TM 9-1090-202-12—Aviation Unit Maintenance Manual: Armament Subsystem, Helicopter 7.62 Millimeter Machine Gun, 2.75-Inch Rocket Launcher: M21 (NSN 1090-00-923-5971) (Used on UH-1B and UH-1C Helicopters).

(2) TM 9-1090-207-13&P Operator, Aviation Unit and Intermediate Maintenance Manual with Repair Parts and Special Tools List (Including Depot Maintenance Repair Parts and Special Tools) for Rocket Management Subsystem Inventory—Deployment, XM138.

(3) TM 9-1055-460-13&P Operator's Aviation Unit and Intermediate Maintenance Manual Including Repair Parts and Special Tools List for 2.75-Inch Rocket Launcher.

c. Instructions for modification of expended launcher tubes are covered in TM 9-1340-203-20, Organizational Maintenance Manual: Rocket Launcher M190 with Subcaliber 35mm Practice Rocket M73.

d. Destruction procedures are contained in TM 43-0002-33, Destruction of Improved Conventional Munitions (ICM) to Prevent Enemy Use.

1-2. Forms, Records, and Reports

a. Authorized Forms. Forms required by organizational maintenance personnel are listed in Appendix A and in DA Pam 310-1.

b. Report of Accidents. Accidents involving injury to personnel or damage to materiel will be reported on DA Form 285 in accordance with AR 385-40.

c. Report of Damaged or Improper Shipment. Materiel received in damaged or otherwise unsatisfactory condition because of deficiencies in preservation, packaging, marking, loading, storage, or handling will be reported on SF 364 in accordance with AR 55-38. Reports of improper shipment or damage caused by transportation discrepancies will be reported on SF 361 in accordance with AR 55-38.

1-3. Reporting of Equipment Publication Improvements

Deleted

Section II. SAFETY, CARE, AND HANDLING

1-4. Safety

Observe precautions generally applicable to ammunition and comply with all regulations and local standing operating procedures. Safety rules peculiar to rockets, rocket motors, and rocket weapon systems are discussed below.

a. Rockets which are delivered to the firing line are pointed in the direction that would cause the least damage in case of accidental ignition. Store rockets with warhead pointed nose down, if practical.

b. Some LAW Systems contain a small amount of radioactive material in the front sight. These systems are identified by the words LIMITED LIGHT SIGHT printed on the launcher and packing containers. No additional storage problems are created by this small amount of radioactive material; however, when disposing of expended launchers in nontactical situations, the front sight should be removed by unscrewing the two screws which secure the sight to the launcher, the sight assembly (Part No. 9234281) must be controlled and disposed of in accordance with AR 385-11.

c. Rocket motors and warheads may include electrical circuits which are susceptible to radio frequency energies and static electricity. Rockets in electrically operated launchers may be susceptible to intiation by electromagnetic radiation.

d. Disassembly of explosive components without specific authorization is strictly prohibited.

1–5. Care and Handling

a. General.

(1) Explosive materials must be handled with appropriate care at all times.

(2) Do not drop, drag, throw, tumble, or otherwise strike boxes containing explosive components. Explosive elements in primers and fuzes are particularly sensitive to heat and shock.

(3) Do not subject rockets to excessive moisture or prolonged exposure to direct rays of the sun.

(4) Keep components in original packing until immediately prior to assembly or preparation for use.

(5) Keep empty storage containers from becoming broken or damaged.

(6) Observe storage procedures outlined in paragraphs 4–3 through 4–5.

b. 2.75-Inch Rockets Only.

(1) Reject crated rockets or rocket motors dropped five feet or more on hard surface.

(2) Reject uncrated rockets or rocket motors dropped two or more feet on hard surface.

(3) Reject fuze-warhead combinations, crated and uncrated, if dropped five feet or more on hard surface.

(4) Contact ammunition supply personnel for disposition of rejected rockets.

CHAPTER 2
DESCRIPTION AND DATA

Section I. 66-MM LIGHT ANTITANK WEAPON (LAW) SYSTEM, M72 SERIES

2-1. Description

The 66-MM Light Antitank Weapon (LAW) system is a lightweight, portable, single-shot weapon used primarily against armored targets, bunkers, and other light field fortifications. As issued, the rocket-launcher unit constitutes the complete weapon system. The rocket launcher, once fired, is considered expendable.

NOTE

In nontactical situations, launchers may be reclaimed for use in training. Contact ammunition supply point for disposition instructions.

The M72 Series LAW System (fig. 2-1) consists of three major components: A rocket launcher, a high explosive antitank (HEAT) rocket, and a sling assembly.

a. Rocket Launcher. The tubular rocket launcher is a telescoping, smooth-bore, open-breech weapon. The outer (front) tube is made of

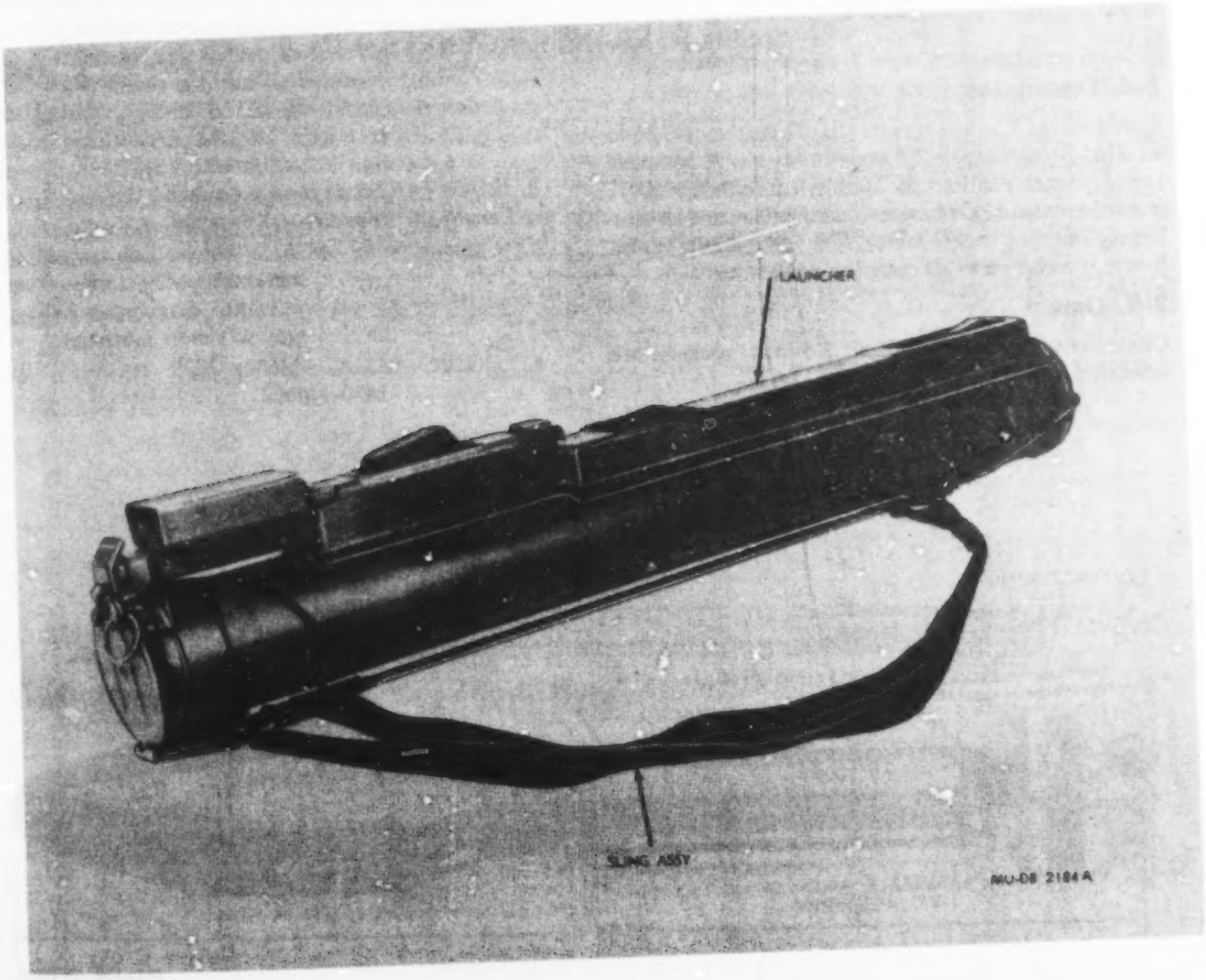


Figure 2-1. LAW weapon system, closed.

plastic-impregnated fiberglass; the inner (rear) tube is made of aluminum. When the launcher is closed, as it is during organizational maintenance, the inner (rear) tube and rocket are not visible.

b. Sling Assembly. The sling assembly consists of end cover and webbing and buckle assemblies.

c. Rocket. The high-explosive, antitank rocket employed in the LAW system consists of a shaped charge warhead, a PIBD fuze and a fin-stabilized rocket motor.

2-2. Data

The following characteristics apply to all currently authorized models of the LAW system:

a. Authorized Models—M72A1 w/coupler (reworked); M72A-2 w/coupler (reworked); M72A2 w/coupler and nozzle wraps (reworked and new production); M72A3 (w/o coupler and nozzle wraps).

b. Weight (Complete Round)—5.2 pounds

c. Color Code (Warhead Only)—Black w/yellow markings

d. DODIC—H557

2-3. Differences Between Models

The 66-mm rocket in LAW System M72A2 and M72A3 provides greater target penetration than the M72A1. Otherwise, the systems are essentially identical in performance.

Section II. 3.5-INCH ROCKETS

2-4. Description

Fin-stabilized 3.5-inch rockets (fig. 2-2) are designed to be fired from reusable 3.5-inch launchers. A complete round rocket consists of a warhead (either HEAT, smoke, or practice), a base-detonating fuze, and an electrically initiated rocket motor. The same model rocket motor is common to all complete rounds.

2-5. Data

Characteristics of authorized 3.5-inch rockets are tabulated below:

a. Authorized Models—M28A2 HEAT; M29-A1 and M29A2 Practice; M30 Smoke (WP).

b. Weight (All Models)—9.0 pounds

c. Length (All Models)—23.6 inches

d. Color Coding—M28A2—olive drab w/yellow markings; M29 series—blue w/white markings; M30—gray w/yellow markings.

e. DODIC—M28A2—M600; M29 series—M601; M30—M602.

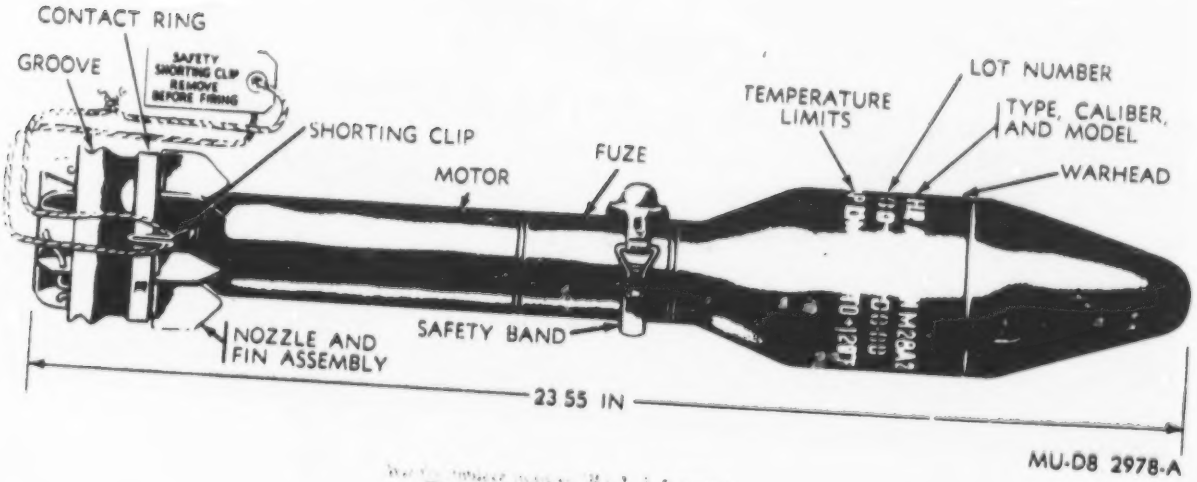


Figure 2-2. Typical 3.5-inch rocket.

Section III. 2.75-INCH LOW SPIN, FOLDING FIN AIRCRAFT ROCKETS (LSFFAR) AND SPIN STABILIZED, WRAP AROUND FIN AIRCRAFT ROCKETS.

2-6. Description

The 2.75-Inch LSFFAR's are air-to-ground rockets (fig. 2-3) designed for deployment from rotary-wing and other low-speed aircraft. Provided with a variety of warheads, 2.75-Inch rockets have a wide tactical application with high point-target effectiveness. In addition, the multipurpose submunition (MPSM) warheads are capable of saturating a target area, thus increasing hit probability against discrete target elements. Except for the practice warhead, WTU-1/B, which is unfuzed, a complete round 2.75-Inch rocket consists of a fuze, a warhead, and a fin-stabilizer rocket motor. The type of warhead with which a round is assembled determines the classification of the complete round (as antipersonnel, HE, HEAT, MPSM, smoke, or practice). See Figures 2-3, 2-3.1, 2-3.2, 2-3.3, and 2-3.4.

The warheads using MK66 Mod 1 motor are spin stabilized, wrap around fin aircraft rockets.

NOTE

Deleted

2-7. Data

NOTE

The MK 66, Mods 1 and 2 motors have been type classified standard for use with warheads M261, M267, and M151. This is a higher velocity, longer range motor. The MK40, Mods 0,1,3, and 4 are currently authorized for use with all other warheads. The motors are white with black markings and a brown band.

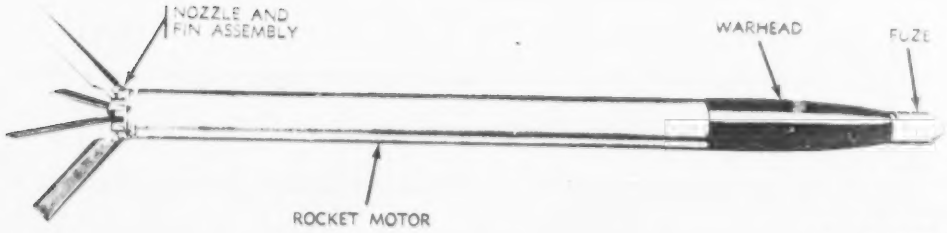


Figure 2-3. Typical complete round LSFFAR.

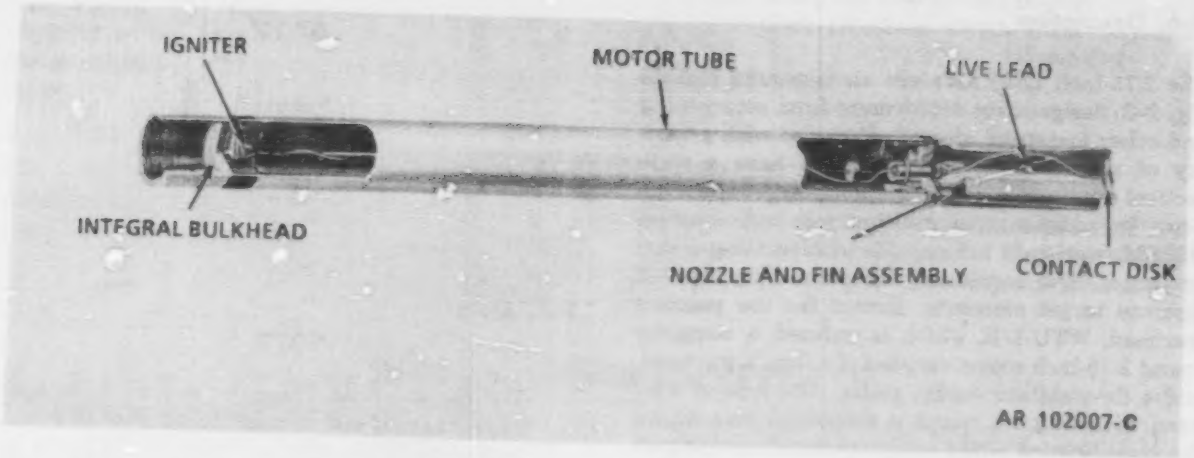


Figure 2-3.1. 2-75-Inch rocket motor Mk40 Mod 3 and Mod 4.

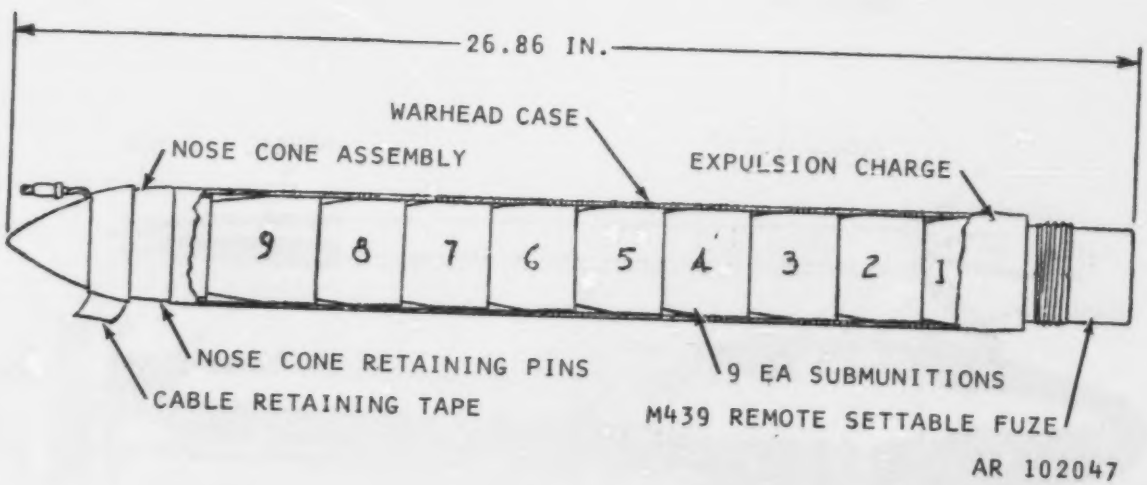


Figure 2-3.2. 2.75-Inch rocket warhead M261 with 9 high explosive multipurpose submunitions or M267 with 3 smoke signature practice submunitions and 6 inert simulators.

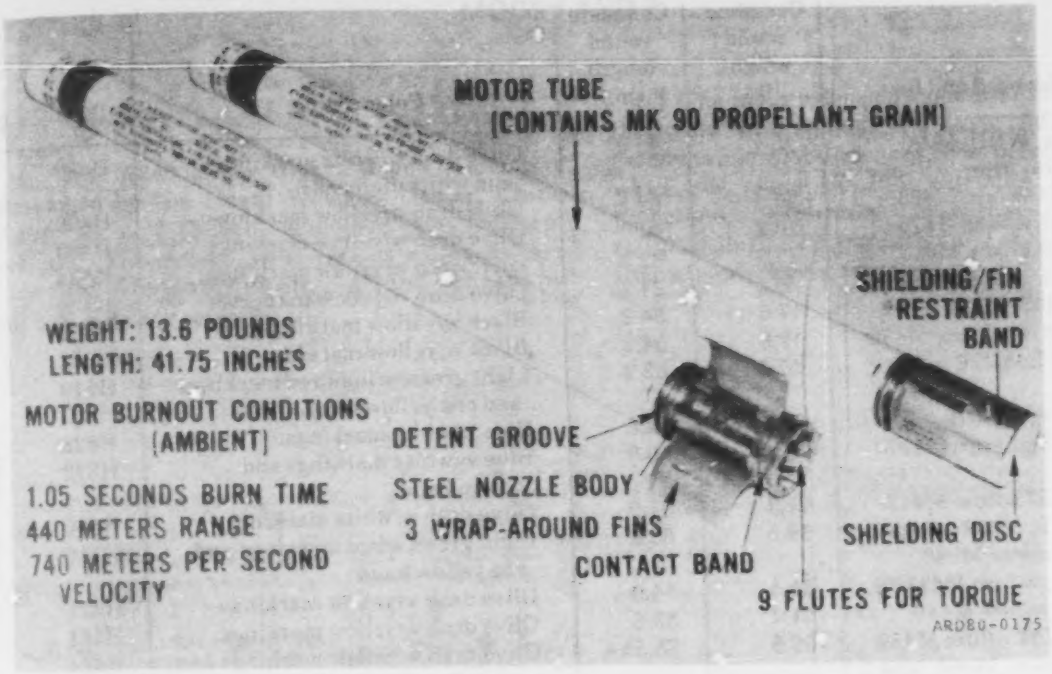


Figure 2-3.3. 2-75-Inch rocket motor Mk66 Mod 1.

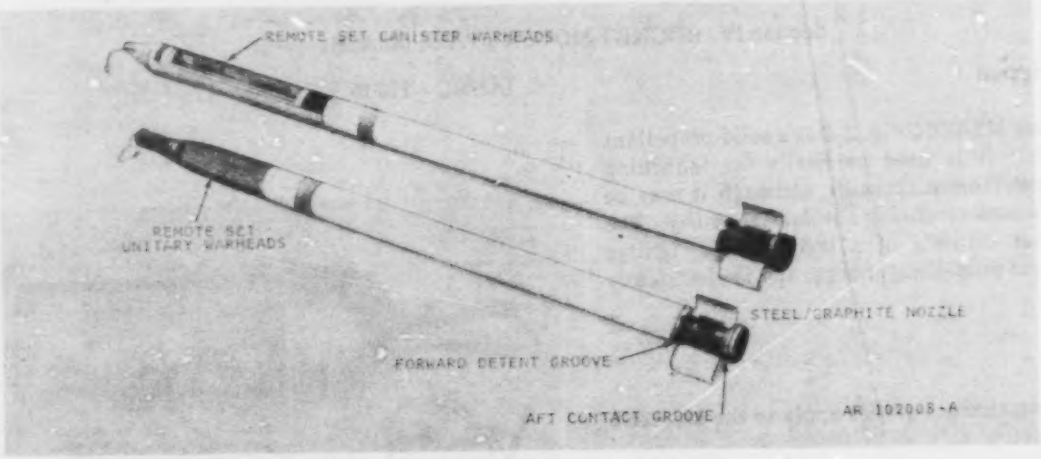


Figure 2-3.4. 2.75-Inch rocket with motor Mk66 Mod 1.

Characteristics of Army authorized complete round LSFFAR are tabulated below:

Warhead and fuze	Complete round weight (lb)	Complete round length (in.)	Color coding	DODIC
Flechette, WDU-4A/A w/integral fuze.	20.2	54.6	Olive drab w/white markings and white diamonds	H459
HE, M151 w/fuze M423.	20.6	52.8	Olive drab w/yellow markings.	H490
HE, M151 w/fuze M429.	20.8	54.7	Olive drab w/yellow markings.	H489
HE, M229 w/fuze M423.	27.9	62.8	Olive drab w/yellow markings.	H534
HE, M229 w/fuze M429.	28.2	64.7	Olive drab w/yellow markings.	H488
HEAT, Mk5 w/fuze Mk181.	17.6	54.2	Black w/yellow markings.	H487
HEDP, M247 w/fuze M438.	19.8	54.3	Black w/yellow markings.	H826
Smoke, WP, M156 w/fuze M423.	20.6	52.2	Light green w/light red markings and one yellow band.	H519
Practice, WTU-1/B	20.8	52.8	Blue w/white markings.	H828
Practice, Signature, M274	9.3	16.0	Blue w/white markings and brown band.	H872
Flare, M257 w/fuze M442.	21.7	67.9	Olive drab w/white markings.	H180
Smoke, WP, M259 w/fuze M446, w/motor Mk40.	19.5	63.8	Light green w/red markings and one yellow band.	H116
HE, M151, w/fuze M433RS.	21.5	54.0	Olive drab w/yellow markings.	H471
HE, M151 w/fuze M440.	21.7	53.6	Olive drab w/yellow markings	H161
MPSM, M261 w/fuze M439 RC w/motors: Mk66, Mod 1.	26.9	65.55	Olive drab w/yellow markings and one yellow band.	H464
Practice, M267 w/fuze M439 RC, Mk66, Mod 1 motor.	26.9	65.55	Blue w/white markings and brown band.	H463
HE, M151 w/fuze M423 w/motor Mk66.	22.2	54.6	Olive drab w/yellow markings	H163
HE, M151 w/fuze M433RS w/motor Mk66.	23.1	55.8	Olive drab w/yellow markings.	H164

Section IV. ROCKET MOTOR (JATO) M3A2E1

2-8. Description

Rocket Motor M3A2E1 (fig. 2-4) is a solid-propellant thrust unit. It is used primarily for launching target drones from a catapult, although it may be put to other uses requiring similar capability. The rocket motor consists of a body, nozzle, igniter assembly and propelling charge, and is electrically initiated.

2-9. Data

The following characteristics apply to the M3A2E1 Rocket Motor:

a. Weight - 27.1 pounds.
b. Dimensions - Length, 21.5 inches; diameter, 5.1 inches.
c. Color Code - Olive drab w/yellow markings.
d. DODIC -- H305.

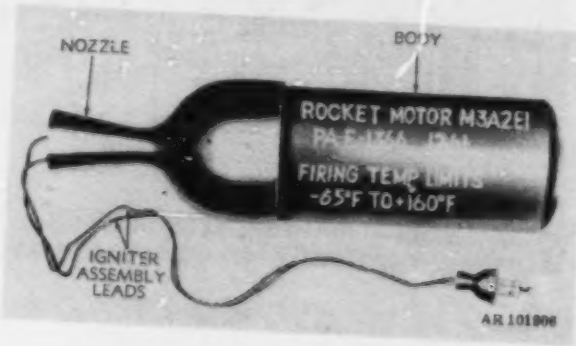


Figure 2-4. Rocket motor M3A2E1.

Section V. ROCKET MOTORS MK40. MODS 0, 1, 3, and 4; MK66, MODS 1 AND 2.

2-10. Description

a. The Mk40 Motor (figs. 2-3 and 2-3.1) was developed by the Naval Weapons Center, China Lake, as a 2.75-Inch, unguided air intercept weapon. The motors, with various warheads, are now used extensively as air-to-ground weapons by all U.S. military services.

(1) The motors develop a nominal 720 pounds of thrust for 1.69 seconds and have folding fins for aerodynamic stabilization. The propellant grain which is made of N-5 extruded double-base propellant, externally inhibited with ethyl cellulose, burns outward from the eight point star-shaped center perforation.

(2) The rocket motor consists of a body, nozzle, igniter assembly and propelling charge, and is electrically initiated.

(3) The Mk40 differs from its forerunner, the Mk4, in nozzle configuration only. The Mod 0 has a nonintegral bulkhead tube; Mods 1, 3, and 4 have an integral bulkhead. Mods 0 and 1 have the igniter Mk125 Mod 4, while Mod 3 has igniter Mk125 Mod 5. Mod 4 has igniter Mk125 Mod 6.

b. The Mk66 motor (figs. 2-3.3 and 2-3.4) Mods 1 and 2 were designed to provide a common 2.75-Inch rocket motor for helicopter and high performance aircraft. They utilize a longer motor tube of a different aluminum alloy, and a new nozzle and fin assembly. The fins are of a spring-loaded, wrap-around design and are attached around the circumference of the single nozzle. The propellant grain is longer, and of a different formulation, than the standard grain; however, the grain supports, igniter, spacers, etc., are essentially the same as used on the standard Mk40 motor. The Mk66 motors have a substantially higher thrust, 1300 pounds, and a longer range. The Mk66 Mods 1 and 2 motors are a nozzle modification of the Mod 0 to increase the spin rate from 4-5.5 rps to 9-10 rps for increased accuracy; only the Mods 1 and 2 are in production. The Mk66 Mod 2 includes an electromagnetic radiation filter to meet navy shipboard requirements.

2-11. Data

Item	Mk66 Motors	Mk40 Motors
Mods	Mod 1 and 2	Mod 0, 1, 3, and 4
Length, in.	41.76	39.9
Weight, lb, before firing	13.6	11.4
Nominal shipping, lb	13.6	12.7 (w/fin protector and head support)
Burn time, sec (77°F)	1.10	1.55-1.69
Average thrust, lb (77°F)	1370-1300	750-720
Impulse, lb--sec (77°F)	1500	1150
Motor burnout		
Range, ft	1300	1460
Velocity, fps	2425	1965
Launch spin rate, rps	9-10	1
Launcher exit (64.5 in. tube)		
Velocity, fps	148	112
Acceleration, g		
Initial	60-70	35-40
Final	95-100	40-45
Range--maximum at QE 43°		
(MPSM warhead), M	8,800	8,080
Igniter	Mk125	Mk125
Resistance, ohms	0.7 to 2.0	0.7 to 2.0
Propellant	NOSIH AA-2	Mk43 (N-5)
Weight, lb	7	5.9
Temperature limits, F°		
Storage	-50° to +160°	-50° to +150°
Operation	-50° to +150°	-50° to +150°
DODAC	1340-J146 (Mod 1) 1340-J147 (Mod 2)	1340-J107 (Mod 0) 1340-J108 (Mod 3)

Color Code: Case is olive drab, white or blue-gray, with a brown band near the head and yellow or black markings.

Packing: One motor with propellant grain, coated stabilizer rod, igniter and fin assembly in a fiber container; six containers per wooden box (when packed separately from the warheads).

Item	Mk66 Motors	Mk40 Motors
Packing box		
Weight w/contents, lb	146	131
Dimensions, in.	48-5/8 x 11-7/8 x 9-9/32	46-3/16 x 11-7/8 x 9-9/3
Cube, cu ft	2.9	2.8
Shipping and Storage Data:		
Quantity-distance class	1.3	1.3
Storage compatibility group	C	C
DOT shipping class	B	B
DOT designation	Rocket Motors, Class B Explosives	
Field storage group	F	F
Drawings	233AS400	1373658 9220803

CHAPTER 3

MAINTENANCE INSTRUCTIONS

Section I. SERVICE UPON RECEIPT OF MATERIEL

3-1. General

a. Upon receipt of rockets, rocket motors, and rocket weapon systems, verify each packaged item against the requisition list. If marking on packaging conflicts with nomenclature on issue document, an error has been made. Notify ammunition supply point of exact discrepancy.

b. Unless packing boxes show evidence of excessive wetness, obvious damage or inner pack penetration, do not unpack them until materiel is to be used.

3-2. Precautions

a. Avoid injury from sharp edges when cutting and handling metal strapping (bands).

b. Limit number of rocket fuzes and amount of flammable liquid at work site to that necessary for efficient operation.

c. All standard precautions for care and handling of ammunition are applicable to rockets. For specific precautions, refer to paragraphs 1-4 and 1-5.

3-3. Unpacking Procedures

a. Inspection.

(1) Inspect markings (FSN, nomenclature and lot number) on packing box for legibility. If illegible, open box and note markings on inner pack or rocket and restore illegible numbers.

(2) If box is damaged beyond repair, transfer contents to another box (para 3-15) and mark appropriately (para 3-13).

(3) Visually inspect each packing box for evidence that rockets might have been damaged. Unpack (*b*, *c*, and *d*, below) only as far as necessary to determine serviceability of items.

(4) Do not open barrier bags which are obviously undamaged.

NOTE

Save some boxes and packaging materials for immediate reuse. Contact direct support maintenance for disposition of remainder of boxes.

(5) Give priority of issue to any items on which the moisture-proof seal has been broken.

b. Pallets.

WARNING

Wear gloves and safety goggles/face shield when cutting banding, and be careful of banding tension release.

(1) Cut wire band with metal cutting shears or similar cutting tools.

(2) Remove boxes.

c. Wirebound Boxes (fig. 3-1).

(1) Cut off wire seals and discard.

(2) Disengage wire loops with Sallee closer (fig. 3-2), screwdriver or pliers, and lift lid panel.

(3) Remove top layer(s) of packing.

(4) Life outbagged fiberboard box.

(5) Cut open barrier bag along edge with most excess material, as close to seal as possible.

(6) Open fiberboard box by pulling sealing strip, and remove cushioning material.

(7) Remove item carefully.

d. Wood Boxes (fig. 3-3).

NOTE

To prevent injury, cut straps on side while pressing down on top to release tension.

(1) Cut steel strapping with metal cutting shears.

(2) Open box and remove fiber container.

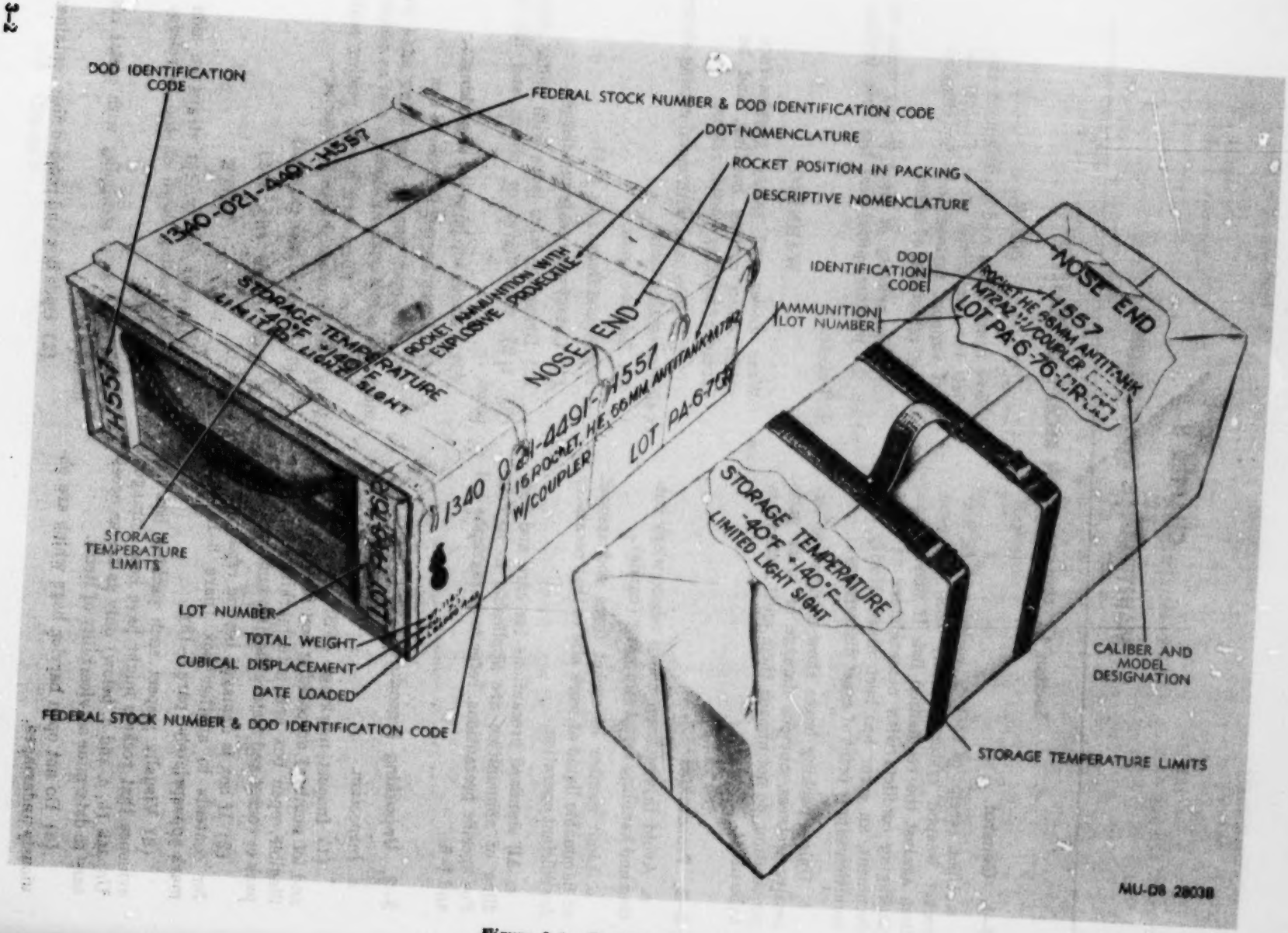
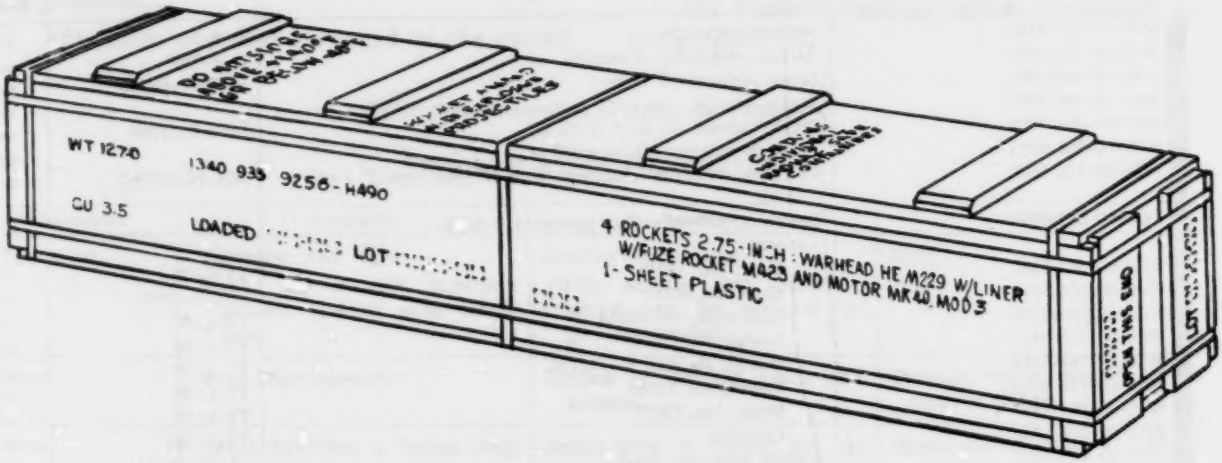


Figure 3-1. Typical wirebound box

MU-D3 2704

Figure 3-2. Sallee closer.



MU-D8 2805

Figure 3-3. Typical wood box.

(3) Remove sealing tape and open fiber container.

(4). Remove item carefully.

Section II. TOOLS AND EQUIPMENT

3-4. Common Tools and Equipment

Standard and commonly used tools and equipment having general application to rockets, rocket motors, and rocket systems are authorized for issue by tables of organization and equipment (TOE).

3-5. Repair Parts and Special Tools

Repair parts and special tools required at organizational level are listed in appendix D.

Section III. MAINTENANCE

3-6. General

a. Maintenance at the organizational level is performed by designated personnel in using units and is primarily preventive in nature. It is performed to prevent further deterioration of materiel which has been exposed to rough handling or adverse weather conditions. Direct support units may be called upon to provide technical assistance and packing materials for accomplishing maintenance.

b. Responsibilities for maintenance are limited to those functions specified in appendix C, maintenance allocation chart (MAC).

c. Maintenance will be performed at least 100 f from any ammunition magazine or storage shelter.

d. Remove ammunition from packaging before pe forming maintenance on packaging materials.

3-7. Consumable Materials

a. Paint, cleaning compounds, and other consumab materials authorized for use by organizational mai tenance personnel are listed in table 3-1.

b. Consumable materials should be requisitione through normal supply channels on an asrequired basi

Table 3-1. Consumable Supplies

(1) National stock no.	(2) Nomenclature	(3) Military spec.	(4) Unit of issue
6810-00-184-4796	Acetone, technical	O-A-51	gl
6810-00-205-6786	Alcohol, denatured: Grade IV	O-E-760	qt
8020-00-240-6361	Brush, Artist's: 1/8 in. w	FED-W-B-118	ea
8020-00-262-9098	Brush, Artist's		ea
8020-00-889-7919	Brush, varnish: 1½ in. x 13/32 in.	MIL-B-21766	ea
8020-00-262-9084	Brush, lacquering: 3/8 in. x 5/8 in.		ea
6850-00-174-9672	Corrosion removing compound: wipe-off type, type II, 1 gal. bottle.	MIL-M-10578B	ea
7930-00-249-8036	Detergent, painted surface powdered: 5-lb cntr		ea
8010-00-582-5382	Lacquer:		
8010-00-664-1914	Black, No. 37038	TT-L-50	cn
8010-00-584-3149	Gray, No. 36231	MIL-L-6805	cn
8010-00-721-9479	Olive drab, No. 14064	TT-L-50	cn
8010-00-584-3148	Orange, No. 12215	TT-L-50	cn
8010-00-721-9744	Orange, (bright), No. 12197	TT-L-50	cn
8010-00-584-3150	Yellow, No. 13538	TT-L-50	cn
8010-00-067-5436	White, No. 37875	TT-L-50	cn
7520-00-973-1059	Colorless	TT-E-488	cn
7520-00-973-1062	Marker, tube type: black	GG-M-00114	pg
7520-00-079-0288	Marker, tube type: red	GG-M-00114	pg
5315-00-889-2745	Marker, tube type: yellow	GG-M-00114	pg
8010-00-297-2122	Nail, box: style 4, type II, 8d, 2½ in.	FF-N-105	pg
8010-00-063-8968	Enamel:		
8010-00-297-2119	Black, No. 37038	TT-E-516	gl
8010-00-828-3193	Brown (dark tan), No. 30117	MIL-L-11195	gl
8010-00-297-2116	Medium blue, No. 35109	TT-E-516	gl
8010-00-297-2113	Light green, No. 34558	TT-E-516	gl
8010-00-844-0870	Olive drab, No. 34087	TT-E-516	gl
8010-00-297-2112	Olive drab, No. 31087	TT-E-516	gl
8010-00-297-0568	Orange (vivid) No. 32246	TT-E-515	pt
5350-00-271-7935	Yellow, No. 33538	TT-E-516	gl
8010-00-161-7275	White, No. 37875		
7920-00-205-1711	Paper, abrasive, flint: Gr 2/0 ½ x 6 open coat, gr 1.2.2, class 1, 100 sh	P-P-105	pk
5350-00-242-4405	Primer, paint: zinc chromate	TT-P-666	gl
8135-00-281-4071	Rag, wiping: cotton, unbleached, mixture	DDD-R-30 grade 8	bg
8135-00-283-0671	Wool, metallic:		
7510-00-266-6711	Strapping, steel: 5/8 in.	QQ-S-781	ro
7510-00-266-6715	Strapping, steel: 1¼ in.	QQ-S-781	cl
8010-00-160-5788	Tape, masking: 3/4 in.	UU-T-106	cl
9505-00-294-7373	Tape, pressure sensitive adhesive: 2 in.	PPP-T-60	ro
	Thinner, lacquer, clear	TT-T-266	ro
	Wire, steel, carbon: round, zinc coated, .0625 in. diam, medium temper.	QQ-W-461	pl
			cl

3-8. Inspection of Packaging

If initial receipt inspection or periodic storage inspection of packaging reveals damage or deterioration to the extent that serviceability of the ammunition is questionable, unpack ammunition (using procedures in paragraph 3-3), and visually inspect inner packs and/or items. Unpack only as far as necessary to determine serviceability.

a. Packaging Defects. Specific inspection criteria and identification of defects (as acceptable, reparable, or irreparable) are outlined in table 3-2. The most commonly encountered packaging defects are listed below:

(1) Outer containers (boxes) damaged, weathered, or rotted to the extent contents are not protected.

(2) Inner container damaged to the extent contents are not protected or cannot be readily removed.

(3) Container cap or closure insecure to the extent contents are not protected.

(4) Inner containers wet (except metal), rusted, moldy or mildewed.

(5) Hardware or strapping loose, missing, broken or ineffective.

(6) Handle or cleat missing or broken.

(7) Contents loose to the extent item may be damaged in handling.

b. Corrective Action.

(1) Replace unserviceable containers using procedures in paragraph 3-15.

(2) Repair broken or damaged boxes using procedures in paragraph 3-12.

(3) Replace banding using procedures in paragraph 3-11.

Table 3-2. Inspection Criteria for Packaging

WOODEN BOXES AND CRATES

Component	Acceptable	Reparable	Irreparable
Hardware	Operative and tight	Inoperative or loose	None
	Nails, screws and fasteners present and in good condition.	Nails, screws, and fasteners which can be replaced or properly sealed.	None
Ends	Free from damage	Broken or missing cleats and handles.	Damage which requires disassembly of box.
Wood	Splits less than 3 inches long, no closer than 1 inch to edge of board or adjoining split. The board must be secured by at least one nail on each side of the split when it extends to the end of the board.	Splits over 3 inches but no closer than 1 inch to edge of board or adjoining split, or ⅛-inch wide, which can be repaired by use of corrugated fasteners.	Splits closer than 1 inch to edge of board or adjoining split or over ⅛-inch wide.
	Warping which does not prevent sealing of box or insertion of required ammunition.	None	Warping which prevents insertion or removal of rounds and/or sealing of the box.
	Light mold which can be brushed off. Mildew stains which do not affect legibility of markings.	None	Excessive mildew and mold which cannot be removed and which render markings illegible.
	Sound tight knots, the diameter of which does not exceed ⅓ the width of the board.	None	Holes or loose knots which exceed 1½ inches in largest diameter or ⅓ width of board.
	Skids securely attached to box or crate. Knots no greater than ¼ the width of skid.	Loose skids	Knots greater than ¼ the width of skid.
Strapping	Present and unweakened by rust or distortion.	Missing, rusted or distorted	None
Wires	Present and intact	None	Broken or rusted through

Component	Acceptable	Reparable	Irreparable
FIBER CONTAINERS			
Metal ends	Minor rust, cracks, indentations, or splits which do not impair waterproofing or serviceability of container.	None	Perforations, excessive rust, or ends which are crushed or not securely crimped to body.
Body and cap	No tears, cuts, or gouges	Cuts, tears or gouges not closer than 1 inch to closure, less than ½ square inch in area, and unpenetrated layers which can be spot painted.	Cuts, tears, or gouges closer than 1 inch to closure, more than ½ square inch in area, or through all impregnated layers.
	No mold, mildew, or rot	None	Molded, mildewed, or rotted
	Free from wrinkles caused by looseness between layers.	None	Wrinkled or peeling
	Blisters with combined area totaling less than ½ square inch.	None	Blisters with combined area of more than ½ square inch.
	No moisture absorbtion	None	Wet or soft containers
METAL CONTAINERS			
Body	Dents less than ¼-inch deep	Dents deeper than ¼ inch which may be removed without weakening structure of container.	Dents which impair the structural integrity of the material.
	Tight seams which prevent entrance of moisture.	None	Loose or leaking seams
	Free from rust	Minor rust which can be removed.	Rust which has caused pitting and perforations.
	Free from perforations	None	Perforated
	Supports which are integral to container present and in serviceable condition.	Supports which can be replaced	Damaged supports which are integral to container.
Caps and covers	Free from rust	Minor rust which can be removed.	Rust which has caused excessive pitting.
	Free from perforations	None	Perforated
METAL BOXES			
Body and cover	Free from rust	Minor rust which can be removed.	Extensive pitting and rust
	Tight seams	Repair not practical	Split seams
	Dents not exceeding a total of 4 square inches per side, end, or top.	Dents exceeding 4 square inches per side, end, or top or deeper than ¼ inch.	Dents which cause creases or folds in metal which cannot be removed.
	Unperforated	None	Perforated
	Separators integral to container serviceable, allowing easy insertion and removal of contents.	None	Missing or broken separators
	Gaskets present and sufficiently serviceable to insure moisture-proof pack.	Damaged or missing gaskets	Not applicable

3–9. Inspection of Ammunition

WARNING

Do not extend 66-MM LAW launcher to open position during inspection.

On launchers marked LIMITED LIGHT SIGHT, front sight contains a small amount of radioactive material. If launchers are returned with broken front sight, remove sight and seal in plastic bag. Segregate for disposition by authorized personnel in accordance with AR 755–15.

Conduct inspections on electrically initiated rocket motors in approved area complying with HERO (hazards of electromagnetic radiation to ordnance) requirements specified in *a*, below.

Do not perform inspection in exposed area during rainy or wet conditions or during electrical storms. Except during electrical storms, inspections may be performed inside a building at any time.

a. HERO (Hazards of Electromagnetic Radiation to Ordnance) Requirements.

(1) Premature initiation of rocket motors by induced current from radio frequency (RF) signals is possible. Tables 3-3 through 3-5 show minimum safe distance in relation to transmitter power.

(2) Lightning is a hazard to all explosives. A strike or nearby miss is almost certain to initiate sensitive explosive elements in rockets.

(3) Inspection and maintenance operations should not be performed within 155 meters of energized power transmission lines.

Table 3-3. Minimum Safe Distance Between RF and Electric Transmitters and Rocket Storage Areas

Transmitter power (watts)	Minimum safe distances (feet)[3]	
	Commercial AM broadcast transmitters	HF transmitters other than AM broadcast
100	750	750
500	750	1700
1,000	750	2400
4,000	750	4800
5,000	850	5500
10,000	1300	7600
25,000	2000	12000
50,000[1]	2800	17000
100,000	3900	24000
500,000[2]	8800	55000

[1] Present maximum power of U. S. broadcast transmitters in commercial AM broadcast frequency range (0.535-to-1.605 MHz).
[2] Present maximum for international broadcast.
[3] To convert feet to meters on this chart—feet × 0.3 = meters.

Table 3-4. Minimum Safe Distance Between Mobile RF Transmitters and Rocket Storage Areas

Transmitter power (watts)	Minimum safe distances (feet)[7]				
	MF 1.6-to-3.4 MHz industrial	HF 28-to-29.7 MHz amateur	VHF 35-to-50 MHz pub. use 42-to-44 MHz pub. use 50-to-54 MHz amateur	VHF 144-to-148 MHz amateur 150.8-to-161.6 MHz public use	UHF 450-to-460 MHz public use
5[1]				15	10
10	40	100	40	35	20
50	90	220	90	50	30
100	125	310	130	65	40
180[2]				75	45
250	200	490	205		
500[3]			290	115	70
600[4]	300	760	315	150	90
1,000[5]	400	980	410		
10,000[6]	1250		1300		

[1] Citizens band radio (walkie-talkie) (26.96-to-27.23 MHz)—minimum safe distance—five feet.
[2] Maximum power for 2-way mobile units in VHF (150. 8-to-161.6 MHz range) and for 2-way mobile and fixed station units in UHF (450-to-460 MHz range).
[3] Maximum power for major VHF 2-way mobile and fixed station units in 35 to 44 MHz range.
[4] Maximum power for 2-way fixed station units in VHF (150.8-to-161.6 MHz range).
[5] Maximum power for amateur radio mobile units.
[6] Maximum power for some base stations in 42-to-44 MHz band and 1.6-to-1.8 MHz band.
[7] To convert feet to meters on this chart—feet × 0.3 = meters.

Table 3-5. Minimum Safe Distances Between TV and FM Broadcasting Transmitters and Rocket Storage Areas

Effective radiative power (watts)	Minimum safe distances (feet)[4]		
	Channels 2 to 6 and FM	Channels 7 to 13	UHF
Up to 1,000	1,000	750	300
10,000	1,800	1,300	600
100,000[1]	3,200	2,300	1,100
316,000[2]	4,300	3,000	1,450
1,000,000	5,800	4,000	2,000
5,000,000[3]	9,000	6,200	3,000
10,000,000	10,200	7,400	3,500
100,000,000			6,300

[1] Present maximum power, Channels 2 to 6 and FM.
[2] Present maximum power, Channels 7 to 13.
[3] Present maximum power, Channels 14 to 83.
[4] To convert feet to meters on this chart—feet × 0.3 = meters.

b. Materiel Defects. Specific defects (identified as acceptable, reparable or irreparable) and inspection criteria are outlined in table 3–6. The most commonly encountered types of materiel defects are listed below:

(1) Peeling, blistered or scratched protective coatings on painted surfaces.

(2) Warhead rust and deterioration.

(3) Corroded fuze well.

(4) Rust and corrosion on rocket motors.

(5) Cracked or dented metal components.

(6) Missing, illegible, incorrect, or misleading markings.

(7) Mixed types and lots of ammunition (such as HE with practice, WP with other smokes; etc.).

Table 3–6. Inspection Criteria for Rockets

Component	Acceptable	Reparable	Irreparable
66–MM LAW			
Launcher	Firing mechanism, safety devices and components present and undamaged. Free from cracks	None None	Cracked, dented, bowed, loose, or missing firing mechanism, safety devices, or other components. Cracks in launcher
2.75–INCH ROCKETS WARHEAD			
Body	Free from exudation Free from cracks Minor corrosion on metal surfaces.	None None Minor corrosion which can be removed with fine sandpaper or steel wool.	Filler exudation Cracks in warhead Corrosion which cannot be removed with fine sandpaper or steel wool.
Fuze well	Clean, undamaged threads, free from rust. Light corrosion on liner	Light rust which can be removed. Minor corrosion which can be removed.	Damaged or heavily rusted threads. Extensive corrosion or etching
Paint or protective coating.	Minor scratches Free from blistering and peeling.	Scratches through entire paint layer. Blistering or peeling in spots	Deep dents, gouges, or scratches Blistering or peeling requiring complete repaint.
Marking	Markings legible and correct	Marking illegible but correct data available for remarking.	Correct data cannot be determined.
2.75–INCH ROCKET FUZES			
Ogive	Minor scratches Tight assembly Light corrosion	None None None	Dents, gouges, or deep scratches Loose ogive Extensive corrosion
Markings	Markings legible and correct	Markings illegible but correct data available.	Correct data cannot be determined.
Body	Free from corrosion Free from cracks Threads undamaged	None None None	Extensively corroded Cracks in metal parts Threads damaged
ROCKET MOTORS			
Body	Free from cracks Free from dents Threads undamaged and free from rust.	None None Light rust on threads which can be removed.	Cracks in metal parts Dents ⅛-inch or more in depth Damaged or heavily rusted threads.
Paint	Minor scratches	Scratches through entire paint layer.	Deep scratches requiring complete repaint.
Nozzle and fin assembly.	4 fins present and undamaged Fin hinge pin present Nozzle seals present	None None None	Missing or damaged fin Missing fin hinge pin Missing nozzle seals

Table 3-6. Inspection Criteria for Rockets—Continued

Component	Acceptable	Reparable	Irreparable
ROCKET MOTORS—Continued			
	Entire assembly tight	None	Loose assembly
	Nozzles tight	None	Loose nozzles
	Shorting clip present	None	Missing shorting clip
	Live wire intact	None	Broken lead wire
ASSEMBLED COMPLETE ROUND ROCKET			
Assembly	(Inspect for above defects, plus those listed below) Warhead, fuze and motor tightly assembled.	Loosely assembled components which can be tightened.	Assembled components which cannot be tightened or failure of warhead to seat on forward end of rocket motor at any point for full 360°.
3.5-INCH ROCKET			
Warhead	Free from corrosion and scratches.	None	Deep scratches or corrosion
	Free from dents and gouges	None	Dents or gouges
Fuze	Safety band present and secure	None	Missing safety band
	Free from dents and gouges	None	Dents or gouges
	Free from corrosion	None	Corrosion present
Rocket motor.	Free from dents or gouges	None	Dents or gouges
	Fins undamaged	None	Fins dented or broken
	Shorting clip present	None	Shorting clip missing
	Igniter lead wires present and intact.	None	Lead wires missing or broken
ROCKET MOTOR M3A2E1			
Paint	Minor corrosion	None	Extensive corrosion
Markings	Legible and correct	None	Illegible or incorrect
Body	Minor corrosion or scratches	None	Extensive corrosion or deep scratches.
	Free from dents and gouges	None	Dents or gouges
Nozzle	Tightly assembled	None	Loose nozzle
	Free from dents and gouges	None	Dents or gouges
	Igniter lead wires present and intact.	None	Missing or broken igniter lead wires.

c. Corrective Action.

(1) Repack acceptable materiel using procedures in paragraph 3-15.

(2) Clean flaked or blistered coating on reparable items and touch up paint and marking following procedures in paragraph 3-10.

(3) Remark following procedures in paragraph 3-10.

d. Disposition of Irreparable Items. For disposition of irreparable ammunition, contact the next higher maintenance level. Contact EOD personnel for disposition of ammunition items considered to be hazardous.

3-10. Cleaning, Touchup, and Marking of Ammunition

a. Cleaning.

(1) Remove dirt, mud, and other foreign material using rags or brushes. Use rags dipped in alcohol to remove grease.

(2) Using wire brush, remove flaked, chipped, blistered, or peeling paint.

(3) Remove rust using wire brush or sandpaper, and clean with alcohol or acetone dampened cloth.

(4) Clean fuze well and threads with brushes, then rags dipped in alcohol or acetone.

(5) Clean corrosion from aluminum or copper-based metals by first brushing with a wire brush, and then removing residue with rags and corrosion removing compound.

(6) Inspect cleaned item for cracks or other damage or deterioration.

(7) Allow solvent-cleaned surfaces to dry thoroughly before painting.

b. Touchup.

NOTE

Match the original color of paint as closely as possible, using only those paints listed in table 3-1.

(1) Use masking tape to cover existing markings which are in good condition and parts, such as fuze threads, which should not be painted.

(2) Using a spray can or brush, cover bare metal with primer and allow to dry.

(3) Using a spray can or brush, paint primed area with two coats, allowing first coat to dry before applying second.

(4) After paint has dried, remove masking tape.

c. Re-marking.

(1) Observe markings on a like item for correct positioning of data.

(2) Using a felt marker or small brush and paint, restore those markings removed or covered during cleaning and painting and any others requiring touchup. (See tabulated data in chapter 2 for color coding.)

(3) Allow markings to dry before handling or repacking.

d. Repack as specified in paragraph 3-15.

3-11. Maintenance of Packaging Hardware

a. Repair of Damaged Hardware. Hardware which has been damaged to the point that is is inoperable is usually irreparable; however, minor damage can usually be corrected by straightening, as follows:

(1) Using pliers carefully, bend damaged item until its configuration is the same as the serviceable item.

(2) Test repaired hardware for proper functioning.

b. Replacement of Irreparable Hardware. Hardware which cannot be repaired can be replaced with a serviceable item cannibalized from an unserviceable container, as follows:

(1) Using a screwdriver, remove unserviceable hardware.

(2) Attempt to reinstall serviceable hardware in existing holes. Secure with screws.

(3) If screws are missing or cannot be tightened in existing holes, proceed as follows:

(*a*) Replace missing screws with others obtained from an unserviceable box.

(*b*) If screws cannot be tightened, move hardware (with box top in place) to a different location where screws can be secured. If necessary, carve notch to accommodate hinge pin.

(*c*) Mark location for attaching screws, and remove hardware.

(*d*) Drive and remove a small nail at each location to provide a pilot hole.

(*e*) Place hardware and screws in position and secure.

c. Removing Rust or Corrosion from Hardware.

(1) Remove rust and corrosion from hardware by first brushing with a wire brush.

(2) Cover with primer or paint.

d. Replacing Broken, Loose, or Deteriorated Strapping.

(1) Cut pieces of 5/8-inch banding of sufficient length to go around box plus about 6-to-8 inches.

(2) Position strap(s) under box.

(3) Insert one strap end into strap stretcher so that strap is held firmly by stretcher, with about 3 inches of strap protruding.

(4) Place slip over strap end.

(5) Thread loose end of strap through clip and into stretcher head.

(6) Tighten strap by repeated movement of ratchet lever, until edges begin to cut into box.

(7) Using banding crimper, crimp clip in two places.

(8) Release locking pawl on stretcher and slide stretcher out.

(9) Cut off excess strapping.

(10) Repeat (3) through (9) above, for each strap.

3-12. Maintenance of Packaging Containers and Materials

a. Repair of Cracks and Splits in Wood.

(1) Hold board tight so that the crack or split is closed.

(2) Hammer corrugated fasteners into wood at 4- to 6-inch intervals. Fastener should be centered across crack.

b. Repair of Broken Cleats or Wood Handles.

(1) Remove broken cleat with claw hammer or pry bar.

(2) Remove serviceable cleat with claw hammer or pry bar from an otherwise unserviceable box.

(3) Position serviceable cleat on box and secure with 3 to 5 small nails.

(4) Bend nails over inside of box with hammer.

c. Repair of Rope or Strap Handles.

(1) Remove cleats holding handle with claw hammer or pry bar.

(2) Remove serviceable handle from an otherwise unserviceable box by removing the holding cleats with claw hammer or pry bar.

NOTE

Do not remove nails or staples attaching handle to cleats.

(3) Position serviceable handle and cleats and attach to box with 3 to 5 nails in each cleat.

(4) Bend nails over inside of box with hammer.

d. Painting of Wood Boxes. Normally, used boxes will not be painted except to obliterate previous markings or to indicate less than full pack (see para 3-16).

e. Painting of Metal Boxes.

(1) Remove dirt, mud, and other foreign material from boxes using wire brush and/or rags dipped in detergent-water solution. Use rags dipped in alcohol to remove grease.

(2) Using wire brush, remove flaked, chipped, blistered, or peeling paint.

(3) Remove rust and corrosion using a wire brush and sandpaper or rags and corrosion removing compound.

(4) Dry cleaned surfaces thoroughly.

(5) Cover existing markings, if applicable, with masking tape.

(6) Using spray can or brush, cover bare metal with primer and allow to dry.

(7) Using spray can or brush, paint primed area with two coats, allowing first coat to dry before applying second.

(8) Remove masking tape, where applied.

(9) Mark box as required following procedures in paragraph 3-13.

f. Repair of Barrier Bags.

(1) For bags with surface dampness, suspend bag and allow to dry on all sides.

(2) For bags with slight surface mildew or fungus, wash with soap and water without damaging bag. Wipe dry.

3-13. Marking of Packaging Materials

a. Markings on Outer Box. The following information must be legible on each box:

Information	*Example*
Nomenclature	ROCKET, HE, 66-MM: ANTITANK, M72A2 (c/coupler)
National stock number (including DODIC).	NSN 1340-01-021-8012 H557
Lot number	LOT PA-6-76
Date of manufacture	3-71
Quantity	15 (usually precedes nomenclature).

NOTE

Ends of box will have DODIC and Lot Number.

b. Markings on Inner Container. The following information must be legible on each inner container:

Information	*Example*
Nomenclature	ROCKET, HE, 66-MM:ANTITANK, M72A2 (w/coupler)
DODIC	H557
Lot number	LOT PA-6-76
Quantity	5

c. Restoration of Markings.

(1) Carefully observe information and location of markings on packaging of like item.

(2) Using waterproof ink marker, china marking pencil or small brush and paint, restore markings which are faded, obliterated during cleaning, or painted over.

(3) Check markings for accuracy and allow to dry.

(4) Repack ammunition following procedures in paragraph 3-15.

3-14. Assembly of 2.75-Inch Rockets

The 2.75-inch rockets may be issued as either an assembled or unassembled round, requiring assembly of fuze to a motor/warhead combination, or total assembly of motor, warhead and fuze. Organizational personnel are authorized to replace or assemble rocket components in accordance with the following procedure:

WARNING

Ensure that rocket motor, holding fixture, and work table are grounded.

NOTE

Use torquing fixture illustrated in figure 3-4 for all assembly procedures.

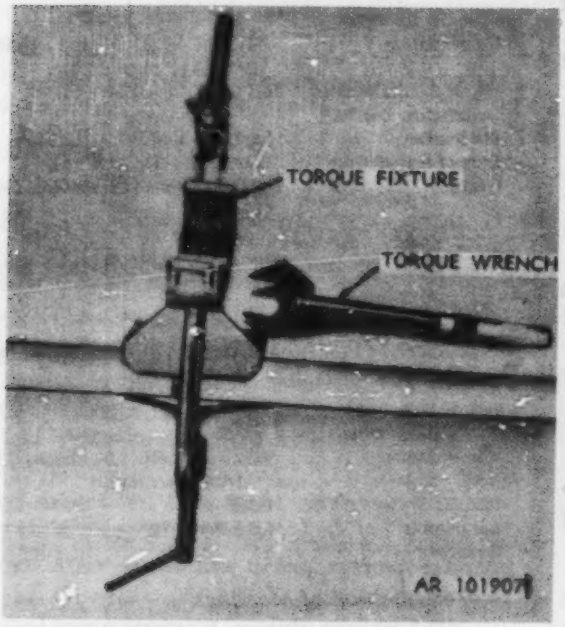


Figure 3-4. Torquing fixture.

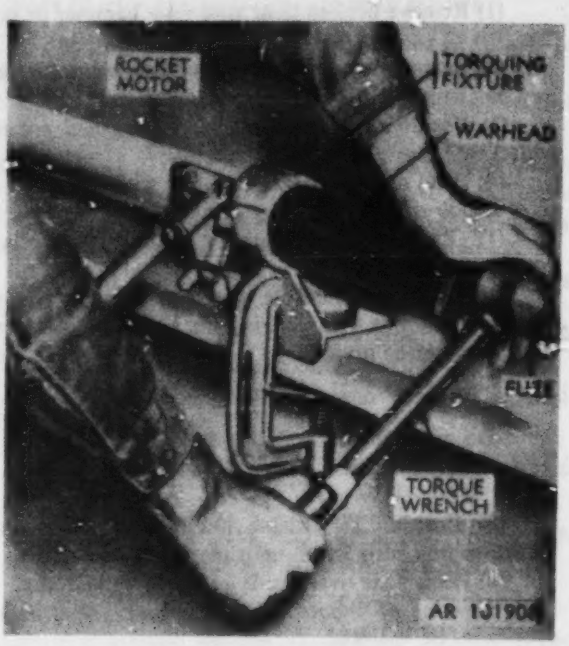


Figure 3-5. Assembly of fuze to warhead.

a. Assembly of Fuze to Warhead.

(1) Position rocket in torquing fixture, as illustrated in figure 3-5.

(2) If replacing an existing fuze, first remove fuze using either crow's foot attached to socket drive handle, rocket fuze wrench, or strap wrench depending on whether or not fuze has slots.

NOTE

Do not use torque wrench for loosening assembled components as calibration may be affected.

(3) Place replacement fuze in fuze cavity and torque to not less than 55 or more than 75 foot-pounds using torque wrench.

b. Assembly of Warhead (Except WDU-4A/A and M257) and fuze to Rocket Motor.

CAUTION

Ensure that torquing device is placed forward of brown band on motor tube to avoid damage to motor case.

(1) Position rocket in torquing fixture (fig. 3-5).

(2) If replacing an existing warhead; loosen assembled warhead from rocket motor using warhead strap wrench. When warhead is loose, unscrew warhead from motor by hand.

(3) Remove warhead to be assembled from packing box.

(4) Assemble warhead to motor hand tight.

WARNING

Failure to torque warhead properly may result in loss of warhead on firing or in flight.

(5) Using torque wrench and crow's foot adapter, torque warhead and motor to not less than 55 or more than 75 foot-pounds.

(6) Check junction of warhead and motor for gap (i.e., failure of warhead to seat on forward end of motor for full 360 degrees after specified torque has been applied). If gap exists, notify authorized ammunition supply personnel for disposition.

(7) Assemble fuze to warhead per previous section.

NOTE

If warheads M229 are to be used with paper tube launchers, wrap bourrelet with insulating tape to protect the warhead from the metal case of the launcher and prevent a short in the firing circuit.

c. Assembly of Flechette Warhead WDU-4A/A and Rocket Motor.

(1) Position motor in torquing fixture (fig. 3-5).

(2) Assemble warhead to motor handtight.

(3) Torque warhead and motor to not less than 55 or more than 75 foot-pounds using warhead strap wrench and torque wrench.

(4) Check that warhead seats tightly against forward end of motor tube. If gap exists (i.e., if warhead fails to seat on forward end of motor at any point for full 360 degrees after specified torque has been applied), reject defective component.

(5) When warheads WDU-4A/A are to be used in launchers LAU-3, apply a band of insulating tape, 1 - to 2 - inches wide, to the warhead so that the center of the tape is located approximately 7 5/16 inches from the forward end of the warhead. This will protect the warhead from the metal case of the launcher and prevent a short in the rocket motor firing circuit.

(6) If rockets are installed in launchers LAU-3 at assembly area, perform the following steps prior to installing nose fairing:

(a) Inspect installed rockets to ensure that insulating tape is properly seated between warhead case and metal case of launcher.

(b) If tape is improperly seated, remove rocket and retape warhead.

d. Assembly of Flare Warhead M257 and Rocket Motor.

(1) Position motor in torquing fixture (fig. 3-4).

(2) Assemble warhead to motor hand tight.

(3) Torque warhead to motor to maximum of 40 foot-pounds using strap wrench and torque wrench. Position strap wrench on warhead only at location marked "torque here to motor".

(4) Check that warhead seats tightly against forward end of motor tube. If gap exists (i.e., if warhead fails to seat on forward end of motor at any point for full 360 degrees after specified torque has been applied), notify authorized ammunition personnel for disposition.

(5) When warheads M257 are to be used in launchers LAU-3, apply a band of insulating tape, 1-to 2- inches wide, to the warhead so that center of the tape is located approximately 7 5/16 inches from the forward end of the warhead. This will protect the warhead from the metal case of the launcher, and prevent a short in the rocket motor firing circuit.

(6) If rockets are installed in launcher LAU-3 at assembly area, perform the following steps prior to installing nose fairing:

(a) Inspect installed rockets to ensure that insulating tape is properly seated between warhead case and metal case of launcher.

(b) If tape is improperly seated, remove rocket and retape warhead.

3-15. Repacking Procedures

NOTE

See table 3-7 for packing and marking data for standard packaging.

NOTE

(Deleted)

Table 3-7. Packing, Marking, and Storage Data

Item	Outer pack	Inner pack	No. items in box	No. items per inner pack	Total weight (lbs)	Total explosive weight (lbs)	Cube	Quantity-distance class	Storage compatibility group
Rocket, HE, 66MM, Antitank: M72A1 or M72A2 w/coupler.	Wire-bound	Fiber-board box inside barrier bag.	15	1	118	10.1 (octol)	7.1	1.1	E
Rocket, HE, 3.5-Inch, Antitank: M28A2.	Wood	Metal or fiber container.	3	1	56	5.7	1.6	1.1	E
Rocket, Practice, 3.5-Inch: M29A1 or M29A2.	Wood	Metal or fiber container.	3	1	53		1.6	1.2	C
Rocket, 3.5-Inch, Smoke, WP: M30.	Wood	Metal or fiber container.	3	1	54	0.06	1.6	1.2	H
Rocket, 2.75-Inch: w/warhead WDU-4A/A and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4	1	162		3.0	1.2	C
Rocket, 2.75-Inch: w/warhead, HE, M151 w/fuze M423 or M429, and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4/25	1	127/776	9.2/573 (comp B4)	3.0/173	1.1	E
Rocket, 2.75-Inch: w/warhead, HE, M229 w/fuze M423 or M429 and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4/25	1	162/986	19.2/1200	3.3/201	1.1	E
Rocket, 2.75-Inch: w/warhead, HEAT, Mk5 w/fuze Mk181 and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4	1	172	3.6 (comp B4)	3.0	1.1	E
Rocket, 2.75-Inch: w/warhead, HEDP, M247 w/fuze M438 and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4	1	162	8.0	3.5	1.1	E
Rocket, 2.75-Inch: w/warhead, smoke (WP), M156 w/fuze M423 and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4	1	162	.5 (comp B4)	3.5	1.2	H
Rocket, 2.75-Inch: w/warhead, MPSM, M261, w/fuze M439 RC and rocket motor Mk66.	Wood	Fiber container.	4	1	162	7.2 (comp B)	3.5	1.1	E
Rocket, 2.75-Inch: w/warhead, practice, M267, w/fuze M439 RC and rocket motor Mk66.	Wood	Fiber container.	4	1	162	—	3.5	1.3	G

Table 3-7. Packing, Marking, and Storage Data - Continued

Item	Outer pack	Inner pack	No. items in box	No. items per inner pack	Total weight (lbs)	Total explosive weight (lbs)	Cube	Quantity distance class	Storage compatibility group
Rocket, 2.75-Inch: w/warhead, practice, M230 w/fuze M435 and rocket motor Mk40, Mod 3.	Wood	Fiber container.	4 25	1	127 776		3.0 17.3	1.2	F
Rocket, 2.75-Inch w/warhead, practice, signature, M274.	Wood	Fiber container.	4	1	59	70 grams	0.62	1.4	F
Fuze, Rocket: Practice, nose M435.	Wood	Carton.	81	81	70		1.1		
Fuze, Rocket: Proximity, M429	Wood	Metal Box.	20	10	40	180 grams	1.0	1.2	B
Fuze, Rocket: Point Detonating, M423	Wire-bound	Metal box.	24	12	41	216 grams	1.0	1.2	B
Fuze, Rocket: Remote set, variable time delay, M439 RC.	Wood	Metal box.	16	8				1.2	B
Rocket Motor (JATO) M3A2E1.	Wood		2		72		1.4	1.3	F
Rocket Motor Mk40.	Wood	Fiber container.	6	1	131		1.3	1.3	C
Rocket Motor Mk66.	Wood	Fiber container	6	1	142		2.9	1.3	C

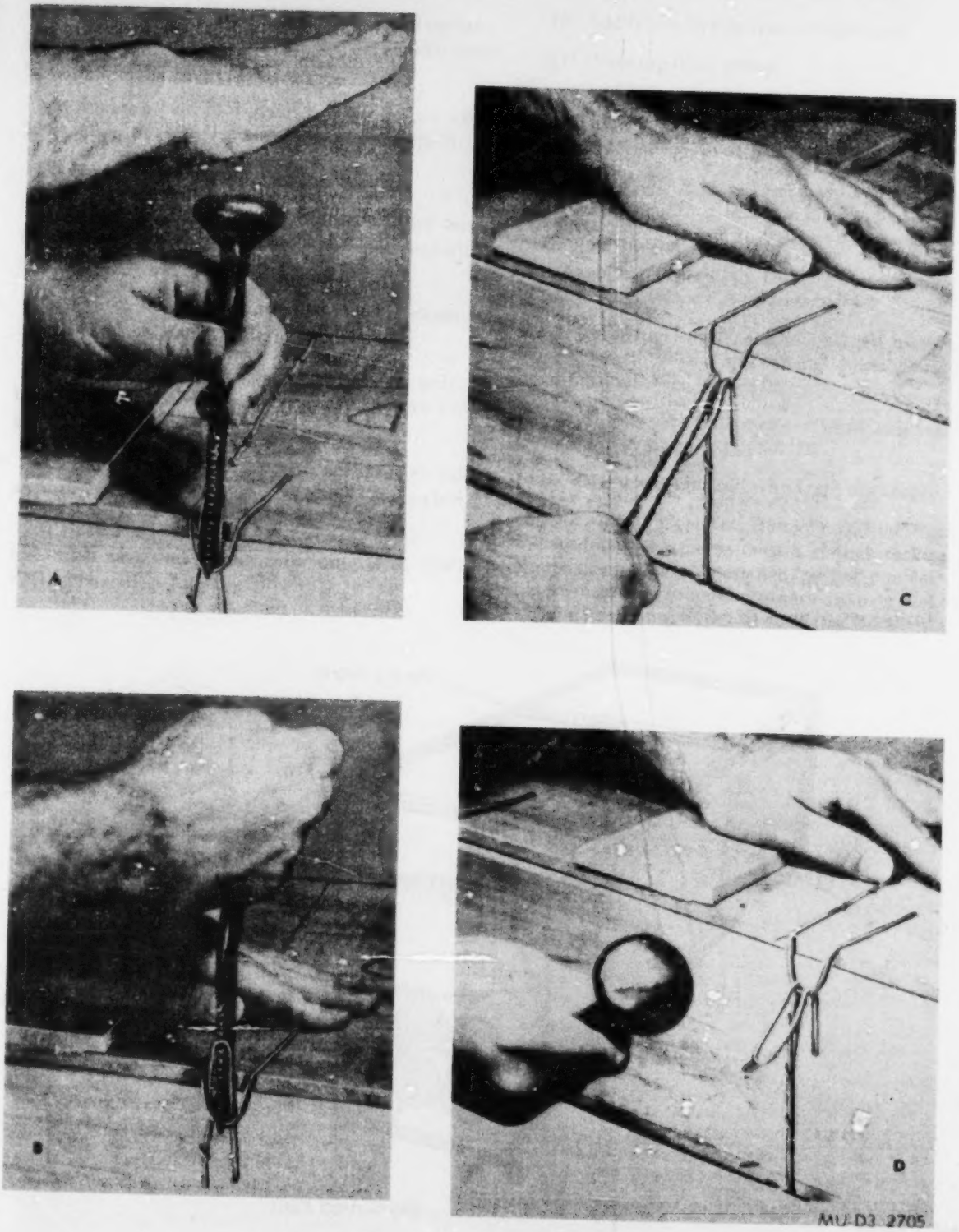


Figure 3-6. Procedure for closing wirebound box.

a. *LAW Systems.* Pack 15 complete weapon systems per wirebound box, as follows:

(1) Pack 5 weapon systems per fiberboard carton, inserting nose end of weapon in front saddle and opposite end in rear saddle.

(2) Insert 5 packed weapon systems in box with front saddle at end of carton marked NOSE END.

(3) Seal carton with tape.

(4) Insert cardboard carton in barrier bag. Exhaust air from bag, fold edges over, and seal with tape.

(5) Attach strap to barrier bag so that package is balanced when lifted.

(6) Repeat steps (1) through (5) above, until a total of 3 cartons (15 weapon systems) have been packed. Then, continue with step (7) below.

(7) Place one filler on bottom, one on each side, and one against nose end of wirebound wooden box.

(8) Pack 3 bagged cartons (15 weapon systems) in box, with nose end of bag coinciding with NOSE END of box.

(9) Insert cushions between cartons and against each end of box opposite from NOSE END.

(10) Add fillers as required for tight pack.

(11) Place top filler on top.

(12) Secure cover with five wire loops using Sallee closer, screwdriver and/or pliers. When using Sallee closer, proceed as follows (fig. 3-6):

(a) Insert Sallee closer (A) to engage larger loop. Strike knob to bend down larger loop.

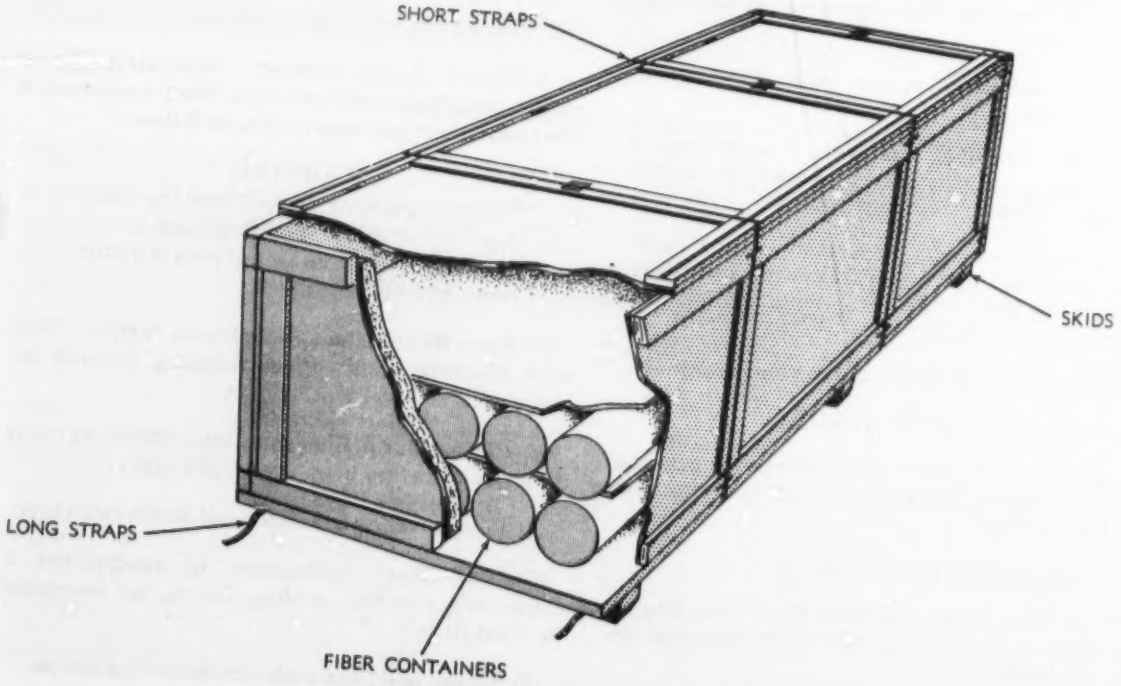
(b) Holding top panel down, reinsert closer (B), keeping teeth away from smaller loop until closer is pushed down as far as possible.

(c) When small loop is engaged in teeth of closer, press down and swing handle around, bending small wire loop as far as possible (C).

(d) Remove Sallee closer from loop and use knob to tap loop against panel (D).

(e) Repeat until all wire loops are secure.

b. *Assembled Complete Round 2.75-Inch Rockets.* Except for repair parts, most 2.75-inch rockets are shipped completely assembled, packed one each per fiber container. Fiber containers are overpacked in wooden boxes in groups of 4 or 25 (fig. 3-7).



MU-D8 2452A

Figure 3-7. Packaging of 25 assembled 2.75-inch rockets.

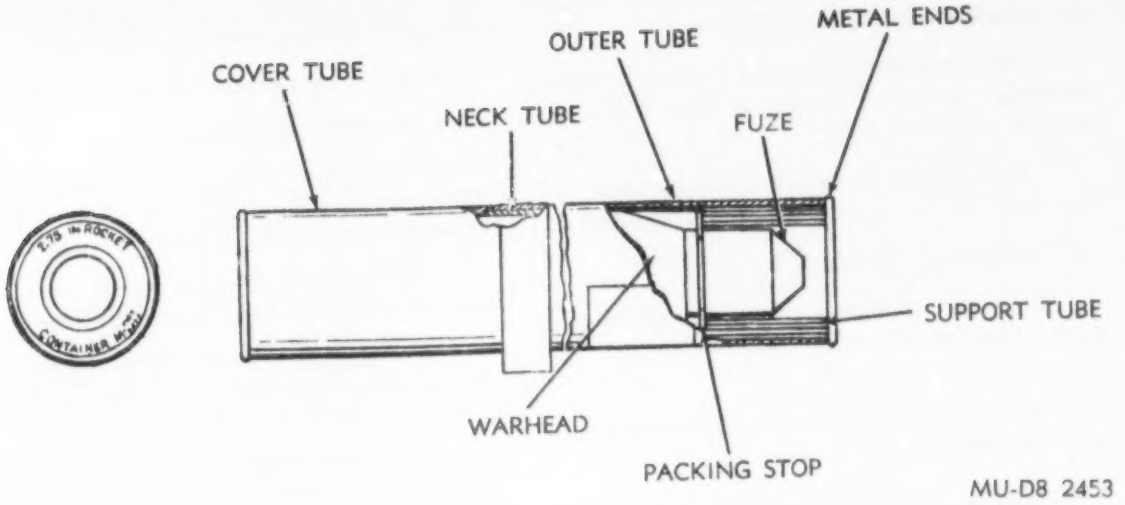


Figure 3-8. Typical fiber container for warhead and fuze.

(1) Pack rockets (one each) in fiber containers.

(2) Arrange fiber containers in layers in wooden box, so that sealing strips are located opposite from the NOSE END of the box.

(3) Cover each layer of fiber containers with a sheet of plastic.

(4) Place fillers between layers and at sides, top and end of box.

(5) Close end panel of box with fasteners or cleats. (Do not nail.)

(6) Secure 25-rocket box with 2 long straps, 4 short straps and 28 staples; 4-rocket box with 2 long straps, 3 short straps and 8 staples.

c. 2.75-Inch Warheads. Separately issued warheads (with or without fuzes) are packed 1 per fiber container (fig. 3-8); 4 fiber containers per wooden box, as follows:

(1) Place warheads (one each) in fiber containers.

(2) Secure fiber containers with tape.

(3) Return containers to original wooden packing boxes. (Check markings on box for contents, and pack accordingly.)

(4) Close and secure packing boxes.

d. Fuzes for 2.75-Inch Rockets. Pack fuzes into an authorized container (fig. 3-9) using material on hand as follows:

(1) Place fuzes in bottom styrene packing in metal containers.

(2) Place upper styrene packing on top of fuzes and close metal top.

(3) Wire metal container lids.

(4) Place containers in wooden boxes and close lid or cover.

(5) Secure box with steel strapping.

e. 2.75-Inch Rocket Motors. Separately issued rocket motors are packed 1 per fiber container, 6 fiber containers per wooden box, as follows:

WARNING

Prior to repacking, install shorting clip (fig. 3-10) or Mk66 shielding band, as applicable, on all rockets or rocket motors removed from launchers.

(1) Place fin separator assembly on rockets fitted with shorting clips. Place shipping support on rockets fitted with fin protectors.

(2) Place motor in fiber container, adding as many fillers as necessary to insure a tight pack.

(3) Place cover on container and secure with tape.

(4) Pack fiber containers in wooden box, 6 containers per box, adding fillers, as necessary for tight fit.

(5) Secure wood box with wire loops and straps.

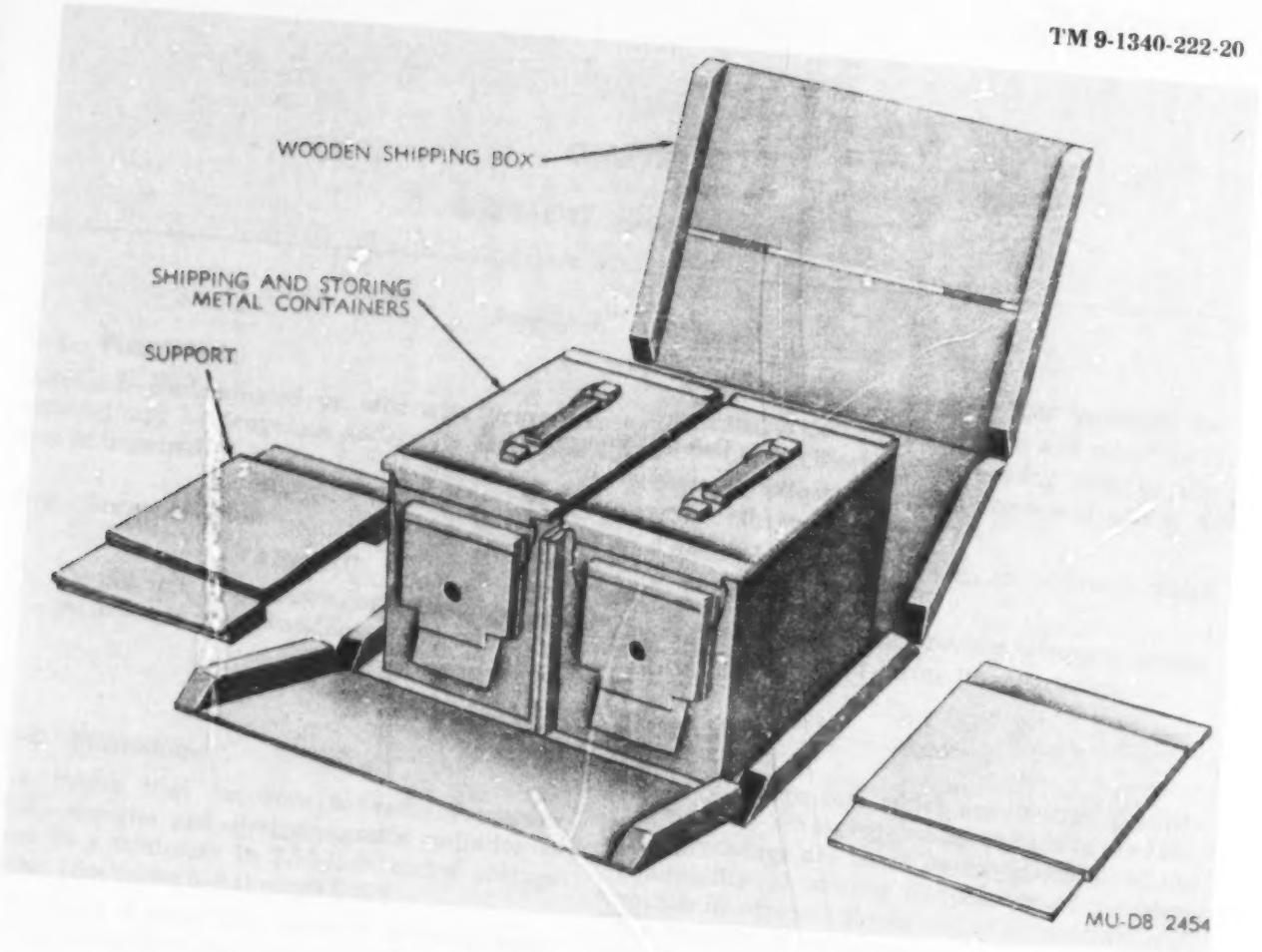


Figure 3-9. Metal shipping container for fuzes.

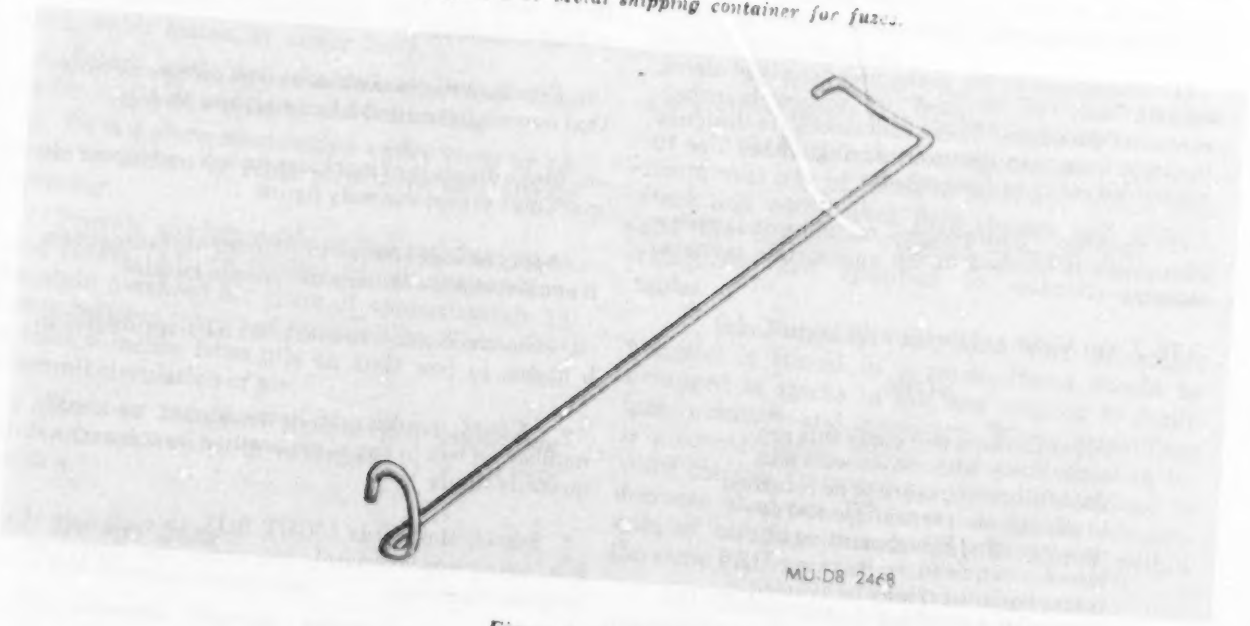


Figure 3-10. Shorting clip.

Deleted - Figure 3-11

h. Shipper-Launche- Containers.

(1) In addition to the packaging described above, rockets may be shipped in shipper-launcher-container packages. These containers are designed to carry, from manufacture to firing, either 7 or 19 assembled ready-to-fire rockets.

(2) Packing information on shipper-launcher containers is covered in the appropriate launcher manual.

3-16. Color Coding of Boxes with Light Loads

NOTE

Organizations will apply this procedure only when boxes with less than full contents are to be returned to storage area or transported to new location. When painting of boxes is required, re-marking (except quantity) may be avoided by applying masking tape on markings prior to painting box.

Boxes with less than full contents will be painted orange as follows:

a. Check contents with markings on box to verify that nomenclature and lot number are correct.

b. Make diagram of markings on box and record all markings except quantity figure.

c. Apply orange enamel to all outer surfaces of box. If enamel is not available use orange lacquer.

d. When box is dry, re-mark box as diagrammed in b, above.

e. Count quantity of items in box and mark number on box in the same position as the original quantity figure.

f. Stencil the words LIGHT BOX on each side of box, using approximately the same size letters as original markings.

CHAPTER 4

SHIPMENT AND STORAGE

Section I. SHIPMENT

4-1. Precautions

Damaged, contaminated or otherwise degraded materiel may be dangerous and/or its usefulness may be impaired.

4-2. Transportation

WARNING

Do not roll, drop, throw, or subject ammunition to rough handling.

a. Block and brace ammunition packages being transported in trucks, jeeps and other tactical vehicles. (Blocking and bracing must be adequate to withstand sudden stops and starts, as well as off-road operations.)

b. Stack ammunition in an attitude which prevents shifting.

c. Insure packaging provides adequate protection for ammunition during transportation.

Section II. STORAGE

4-3. Precautions

a. Insure that exposure to radio frequency (RF) energies and electromagnetic radiation is kept to a minimum in 2.75-inch rocket storage areas. (See tables 3-3 through 3-5.)

b. Select storage site carefully to avoid exposure to power lines and electric cables.

c. Do not store ammunition adjacent to reservoirs, water mains, or sewer lines.

d. Select level, well drained sites free from readily ignitable and flammable materials.

e. Do not store ammunition under trees or adjacent to towers or other structures that attract lightning.

f. Provide nonflammable or fire-resistant overhead covers (e.g., tarpaulin) for all ammunition. Maintain overhead air space of approximately 18 inches between cover and ammunition. Keep cover at least 6 inches from pile on ends and at sides, to permit circulation of air.

g. Store or transport ammunition containing white phosphorus with warhead in a vertical position.

4-4. Storage Data

a. Field Storage Categories.

(1) *General.* Storage categories are the primary groups into which ammunition (including rockets) are segregated for storage in the field. The groupings are based on consideration of the desirability of storing components of complete rounds in adjacent stacks and on consideration of the hazards of propagation of explosion, range of fragments, spread of fires, and contamination. Safety procedures covering storage are based on the following factors:

(*a*) Items having comparable storage risks are grouped together in the same category.

(*b*) Within each storage category, the maximum quantity of items to be stored within each stack and within each field storage unit (FSU), and the minimum distance between FSU and categories are specified in quantity-distance tables.

(*c*) Normally, only one kind of rocket materiel is stored in a stack. Items should be arranged in stacks in the best manner to facilitate inventory and inspection. Where camouflage is a consideration, stacks may be stepped in toward the top (terraced or pyramid stacking) to decrease shadows. Whenever desirable, components of complete rounds may be stored within the same FSU.

(2) *Categories for storage of conventional ammunition.* For storage purposes, conventional ammunition is divided into alphabetical categor-

ies A through F. White phosphorus-filled rockets fall in category A; all other complete round rockets, rocket motors, and rocket weapon systems fall in category F.

b. Quantity-Distance Tables for Field Storage Categories. Procedures set forth in quantity-distance tables 4-1 and 4-2 are to be used as a guide in the storage of rocket materiel in the field only. These procedures are based upon the necessities incident to field storage. It must be emphasized that any reduction of distances or increase in tonnage to those prescribed increases the probability of loss of life and ammunition. Quantity-distance classes, explosive weights and additional storage and packing data are covered in table 3-7. (See also TM 9-1300-206.)

c. Permanent Installation Storage. For permanent installation storage, standard quantity-distance classes and storage compatibility groups given in TM 9-1300-206 apply.

4-5. Procedures

a. Store rockets in a dry, cool place; never in the direct rays of the sun or where temperatures exceed limits marked on containers.

b. Locate rockets on one side of the storage area rather than between other types of ammunition and as far away from other ammunition as practicable.

c. Stack rockets in single rows on tiers. If rockets cannot be pointed nose down, locate stacks where rockets will face a strong natural (or artificial) barrier of not less than three feet of sand or earth and in the direction which would offer the lease damage in case of accidental detonation. Never point rockets in the direction of another stack of ammunition.

d. Use heavy, well supported dunnage to prevent stack from sinking and to keep bottom tier off ground.

e. Use hard stand of gravel and sand rather than excessive dunnage.

f. Allow at least 6-inch clearance beneath stacks for air circulation.

g. Dig suitable trenches to prevent water from flowing under pile.

Table 4-1. Quantity-Distance Table for Smoke (WP) Rockets and Warheads (Category A)

Gross tons per stack	Gross tons per FSU	Minimum distance in feet between: Stacks unbarricaded	Stacks barricaded	FSU unbarricaded	Categories
Less than 10	400	40	30	300	750
10-20 max.	400	50	40	300	750

Table 4-2. Quantity-Distance Table for Complete Round Rockets and Warheads [Except Smoke (WP)], Rocket Motors and Rocket Weapon Systems (Category F)

Gross tons per stack	Stack barricaded and unbarricaded	Minimum distance in feet between: Gross tons per FSU	FSU unbarricaded	FSU barricaded	Categories
The max. allowable gross wt. per stack will be 20 tons.	*	20	200	75	1,500
		30	230	90	1,500
		40	265	99	1,500
		50	295	101	1,500
		60	330	120	1,500
		80	390	125	1,500
		100	455	150	1,500

* The minimum distance between barricaded stacks will be 75 feet. The minimum distance between unbarricaded stacks will be 150 feet.

APPENDIX A

REFERENCES

A-1. Administrative Publications.

a. Publication Indexes. The following publication index should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to the material covered in this manual.

Consolidated Index of Army Publications and Blank Forms ---------- DA Pam 310-1

b. Army Regulations.

Reporting of Transportation Discrepancies in Shipments ---------- AR 55-38
Malfunctions Involving Ammunition and Explosives ---------- AR 75-1
Ionizing Radiation Protection (Licensing) Control, Transportation, Disposal, and Radiation Safety ---------- AR 385-11
Accident Reporting and Records ---------- AR 385-40
Policies and Procedures for Firing Ammunition for Training, Target Practice, and Combat ---------- AR 385-63
Report of Item and Packaging Deficiencies ---------- AR 735-11-2

A-2. Blank Forms.

Discrepancy in Shipment Report (Short Title "DISREP" ---------- SF 361
Report of Discrepancy (ROD) ---------- SF 364
U.S. Army Accident Investigation Report ---------- DA Form 285
Recommended Changes to Publications and Blank Forms ---------- DA Form 2028
Maintenance Request ---------- DA Form 2407
Ammunition Condition Report ---------- DA Form 2415
Fire Report ---------- DA Form 3985

A-3. Doctrinal, Training, and Organizational Publications.

60mm Heat Rocket M72A1, M72A2 (Light Antitank Weapon) ---------- FM 23-33

A-4. Equipment Manuals.

a. Technical Manuals.

Ammunition, General ---------- TM 9-1300-200
Ammunition and Explosive Standards ---------- TM 9-1300-206
Aviation Unit Maintenance Manual: Armament Subsystem, Helicopter, 7.62 Millimeter Machine Gun, 2.75-Inch Rocket Launcher: M21 (NSN 1090-00-923-5971) (Used on UH-1B and UH-1C Helicopters) ---------- TM 9-1090-202-12
Operator, Aviation Unit and Intermediate Maintenance Manual with Repair Parts and Special Tools Lists (Including Depot Maintenance Repair Parts and Special Tools) for Rocket Management Subsystems Inventory—Deployment, XM138 ---------- TM 9-1090-207-13&P
Operator's Aviation Unit and Intermediate Maintenance Manual Including Repair Parts and Special Tools List for 2.75-Inch Rocket Launchers ------- TM 9-1055-460-13&P
Operator's Manual for 66mm Light Antitank Weapon (LAW) System M72A1 and M72A2 with Coupler and Practice Rocket Launcher M190 with M73 Practice Rocket ---------- TM 9-1340-214-10

Organizational Maintenance Manual: Rocket Launcher M190 with Subcaliber 35mm Practice Rocket: M73 ---------- TM 9-1340-203-20
Procedures for Destruction of Improved Conventional Munitions to Prevent Enemy Use ---------- TM 43-0002-23

b. Technical Bulletins.

Munitions: Suspended or Restricted ---------- TB 9-1300-385-1
Munitions: Permanently Suspended or Restricted ---------- TB 9-1300-385-2
Identification of Radioactive Items in the Army Supply System ---------- TB 43-0116
Ammunition: National Stock Numbers and Department of Defense Codes -- TB 9-1300-256

A-5. Supply Catalogs.

Ammunition and Explosives: Classes 1305 through 1330 ---------- SC 1305/30-IL
Ammunition and Explosives: Classes 1340 through 1398 ---------- SC 1340/98-IL

A-6. Supply Bulletins.

Ammunition surveillance Procedure for Rocket, 2.75-Inch, Complete Round; Motors, Mk 40 Series; Warheads, M151, M229, MDU 4A/A, M156, M247, M257; and Fuzes, M423, M427, and M429 ---------- SB 742-1340-92-010

APPENDIX B

BASIC ISSUE ITEMS LIST

(Not applicable)

APPENDIX C
MAINTENANCE ALLOCATION CHART

Section I. INTRODUCTION

C-1. General

a. The maintenance allocation chart designates responsibility for the performance of maintenance functions.

b. Only the lowest level of maintenance authorized to perform a maintenance function is indicated.

c. A maintenance function assigned a maintenance level will automatically be authorized to be performed at any higher maintenance level.

d. A maintenance function that cannot be performed at the assigned level of maintenance for any reason may be evacuated to the next higher maintenance organization. Higher maintenance levels will perform the maintenance functions of lower maintenance levels when required or directed by the appropriate commander.

C-2. Definitions

The implementation of maintenance tasks will be consistent with the assigned maintenance in accordance with the following definitions:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability and to detect incipient failure by measuring the mechanical or electrical characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition.

(1) *Unpack.* To remove item from packing box for service or for the performance of other maintenance operations.

(2) *Repack.* To return item to packing box after service or other maintenance operations.

(3) *Clean.* To rid the item of contamination.

(4) *Touch up.* To spot paint scratched or blistered surfaces.

(5) *Mark.* To restore obliterated identification.

d. Install. To emplace, seat, or fix into position an item in a manner to allow the proper functioning of the equipment; also to assemble one component of an end item with another.

e. Adjust. To maintain within prescribed limits by bringing into proper or exact position, or by setting the operating characteristics to the specified parameters.

f. Renovate. To restore item to serviceable condition.

(1) *Paint.* To repaint the entire item.

(2) *Repair.* To restore serviceability to an item by correcting specific damage, fault, malfunction, or failure through the application of maintenance services or other maintenance actions.

(3) *Replace.* To substitute a serviceable component in a manner to allow the proper functioning of equipment.

C-3. Symbols

Specific levels of maintenance are indicated by symbols, as follows:

Symbol	Maintenance Level
C	Operator/Crew
O	Organization
F	Direct Support
H	General Support
D	Depot

In the maintenance allocation chart, these symbols reflect the lowest level of maintenance responsible for performing a particular function. Maintenance levels higher than that indicated by the symbol are also authorized to perform the function indicated.

Section II. MAINTENANCE ALLOCATION CHART

(1) Group No.	(2) Functional group	(3) Maintenance function												(4) Tools and equipment	(5) Remarks
				SERVICE							RENOVATE				
		Inspect	Test	Unpack	Repack	Clean	Touchup	Mark	Install	Adjust	Paint	Repair	Replace		
0100	ROCKETS														
0101	Rocket, 2.75-Inch: Assembled complete round, all models.	C	D	O	O	C	O	F	O	O	H		O		
	Warheads, Fuzed or Unfuzed: All models.	O		O	O	O	O	F	O		H				
	Fuzes: All models	O	D	O	O	O	O	F	O						
	Rocket Motors: All models	O	D	O	O	O	O	F	O		H				
	Packaging Materials	O		F		O	O	O			O	O	O		
0102	Rocket, 3.5-Inch: Assembled complete round, all models.	C	D	C	O	C	O	D	C	D	D	D	D		
0200	LIGHT ANTITANK WEAPON SYSTEMS														
0201	Rocket, HE, 66-MM: Anti-Tank, M72 Series	C	D	C	O	C	O	F			D	D	D		
	Packaging Materials	O		F		O	O	O				O	O		
0300	ROCKET MOTORS														
0301	Rocket Motor: M3A2E1	C	D	C	O	C	O	D	C	D	D	D	D		

*The 3.5-inch rockets are currently issued to reserve components only. No maintenance other than care and preservation will be performed below depot level.

APPENDIX D

ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

D-1. General

This appendix lists repair parts and special tools required for the performance of organizational maintenance for rockets, rocket motors, and rocket weapon systems. Repair parts are covered in section II; special tools, in section III.

D-2. Definition of Codes

a. Source, Maintenance, and Recoverability Codes (SMR).

(1) *Source code.* Indicates the selection status and source for the items listed. Source codes are:

Code	Explanation
PA	Item procured and stocked for anticipated or known usage.
XB	Item is not procured or stocked. If not available through salvage, requisition it.

(2) *Maintenance code.* Indicates the lowest levels of maintenance authorized to use and repair support items. Capabilities of higher maintenance categories are considered equal or better. Maintenance level codes are:

Code	Explanation
Use—O	Support item is removed, replaced, and used at the organizational level of maintenance.
Repair—O	The lowest maintenance level capable of complete repair of the support item is the organizational level.

(3) *Recoverability code.* Indicates the disposition action on unserviceable items. Items not coded are expendable. Recoverability codes are:

Code	Explanation
O	Reparable item. When uneconomically reparable, condemn and dispose at organizational level.
Z	Nonreparable item. When unserviceable, condemn and dispose at level indicated.

b. National Stock Number (NSN). Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

c. Description. Indicates the National item name and any additional description of the item required.

d. Unit of Measure. A two-character alphabetic abbreviation indicating the unit upon which the allowances are based, (e.g., ft, ea, pr; etc.).

e. Quantity Incorporated in Unit. Indicates the quantity of the item used with or on the ammunition.

f. 15-Day Organizational Maintenance Allowance.

(1) In accordance with AR 700-18, allowance quantities of repair parts are not listed. Each item is authorized for use at the appropriate category of maintenance and may be requisitioned on an as-required basis until stockage is justified by demand.

(2) If justified by demand, recommendations for stockage should be forwarded to Commander, US Army Ammunition Procurement and Supply Agency, ATTN: AMSMU-MM-SA, Joliet, IL 60436.

g. Figure Number. Indicates the figure number of the illustration in which the item is shown.

Section II. REPAIR PARTS

(1) SMR code	(2) National Stock No.	(3) Description	(4) Unit of measure	(5) Quantity incorporated in unit	(6) 15-day organizational maintenance allowances (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) Illustration (a) Figure No.	(b) Item No.
		2.75-INCH ROCKETS—PACKING								
XBOO	8140-00-425-0749	BOX, PACKING, AMMUNITION: for rockets, 2.75-inch (W/warheads M151, M156,M230,MK 5, WDU-4A/A, WTU-1B) Dwg No. 9230114. (19203)	ea	1						
XBOOO	8140-00-104-7646	BOX, PACKING, AMMUNITION: for rockets, 2.75-inch (W/warhead M229) Dwg No. 9230116. (19203)	ea	1					3-3	
XBOOO	8140-00-104-7671	BOX, PACKING, AMMUNITION: for rockets, 2-75-inch (W/warheads M151, M156 and M230) Dwg No. 9235841. (19203)	ea	1						
XBOOO	8140-00-104-7648	BOX, PACKING, AMMUNITION: for rockets, 2.75-inch (W/warhead M229) Dwg No. 9235840. (19203)	ea	1						
XBOOO	8140-00-040-7722	BOX, PACKING, AMMUNITION: for warheads, 2.75-inch M151, M156, M230,MK 5, WTU-1/B, M274 Dwg No. 8886810. (19203)	ea	1						
XBOOO	8140-00-040-7723	BOX, PACKING AMMUNITION: for warhead, 2.75-inch, M229 Dwg No. 9224842. (19203)	ea	1						
XBOOO	4140-00-040-7728	BOX, PACKING, AMMUNITION: for warhead 2.75-inch, WDU-4A/A Dwg No. 9242057 (for CONUS only) (19203)	ea	1						
XBOOO	8140-00-350-7788	BOX, PACKING, AMMUNITION: for rocket motor, 2.75-inch, MK 40, Dwg No. 8883479. (19203)	ea	1						
XBOOO	8140-00-864-3194	BOX, PACKING, AMMUNITION: for rocket fuzes M423, M429 and M435, Dwg No. 8861213. (19203)	ea	1					3-9	
XBOOO	8140-00-040-7732	CHEST, AMMUNITION: for rocket fuzes, M423, M429, M435 Dwg No. 8864492. (19203)	ea	1					3-9	
XBOOO	8140-00-425-0747	CONTAINER, AMMUNITION: fiber, PA 30 for rocket 2.75-inch, (warheads M151, M156, M230, WTU-1/B, WDU-4A/A,MK 5), Dwg No. 9230113. (19203)	ea	1						

(1) SMC code	(2) National Stock No.	(3) Description	(4) Unit of measure	(5) Quality incorporated in unit	(6) 15-day organizational maintenance allowances (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) Illustration (a) Figure No.	(b) Item No.
		2.75-INCH ROCKETS—PACKING—Continued								
XB000	8140-00-040-7735	CONTAINER, AMMUNITION, FIBER: PA 29, for rocket, 2.75-Inch, (warhead M229) Dwg No. 9230115. (19203)	ea	1						
XB000	8140-00-866-6399	CONTAINER, AMMUNITION, FIBER: M523, for warhead 2.75-Inch rocket M151, M156, M230, MK 5, WTU-1/B, M274 Dwg No. . 8886811. (19203)	ea	1					3-8	
XB000	8140-00-040-7736	CONTAINER, AMMUNITION, FIBER: PA26, for warhead, 2.75-Inch rocket, HE, M229 Dwg No. 9224841. (19203)	ea	1						
XB000	8140-00-859-8011	CONTAINER, AMMUNITION, FIBER: M518, for rocket motor, 2.75-Inch, MK 40 Dwg No. 8883478. (19203)	ea	1						
XB000	—	CONTAINER, AMMUNITION, METAL: PA 88 assembly for 2.75-Inch rocket (warhead M151) M261, M264, M267, Dwg. No. 9335650.	ea	1						
XB000	8140-00-040-7737	CARTON, PACKING, AMMUNITION: For warhead, 2.75-Inch rocket, flechette, WDU-4A/A Dwg No. 9242056. (19203)	ea	1						
XB000	8140-00-040-7738	SUPPORT, TOP: For fuze M423, Dwg No. 8882441. (19203)	ea	1						
XB000	8140-00-040-7740	SUPPORT, BOTTOM: For fuze M423 Dwg No. 8882442. (19203)	ea	1						
XB000	8140-00-040-7756	SUPPORT, TOP: For fuze M429 Dwg No. 9217200. (19203)	ea	1						
XB000	8140-00-040-7757	SUPPORT, BOTTOM: For fuze M429 Dwg No. 9217201 (19203)	ea	1						
XB000	8140-00-040-7761	SUPPORT, TOP: For fuze M432 Dwg No. 9242106. (19203)	ea	1						
XB000	8140-00-040-7765	SUPPORT, BOTTOM: For fuze M432 Dwg No. 9242108. (19203)	ea	1						
		66-MM WEAPON SYSTEM—PACKING								
XB000	8140-00-431-3443	BOX, PACKING, AMMUNITION: For rockets, HE 66-MM anti-tank M72A1 or M72A2, w/coupler, Dwg No. 9227926. (19203)	ea	1					3-1	
XB000	8140-00-040-7734	BOX, PACKING, AMMUNITION: For rocket, HE, 66-MM, anti-tank M72A1, M72A2, w/coupler, Dwg No. 9227925. (19203)	ea	1						

(1) SMR code	(2) National Stock No.	(3) Description	(4) Unit of measure	(5) Quantity incorporated in unit	(6) 15-day organizational maintenance allowances (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) Illustration (a) Figure No.	(b) Item No.
		3.5-INCH ROCKETS—PACKING—Continued								
XB000	8140-00-213-1685	CONTAINER, AMMUNITION, FIBER, M229: For rockets 3.5-inch: M28A2 HEAT, M29A1 practice, M29A2 practice, M30 WP Dwg No. 7549038. (19203) ROCKET MOTOR M3A2E1	ea	1						
XB000	8140-00-113-6750	BOX, PACKING AMMUNITION: For rocket motor M3A2E1, Dwg No. 8835922. (19203)	ea	1						
PAOZZ	5120-00-319-5434	SALLEE CLOSER: Dwg No. 8864731 (19203).	ea	1					3-2	
PAOZZ	5110-00-293-0089	SHEARS, METAL CUTTING, HAND: 12½-inch, GGG-S-291. (81348)	ea	1						
PAOZZ	3540-00-565-6242	STRAPPING AND SEALING KIT: (⅝-in. strapping). MILS43104 (81349)	ea	1						
PAOZZ	3540-00-565-6244	STRAPPING AND SEALING KIT: (1¼-in. strapping). MILS43104 (81349)	ea	1						

Section III. SPECIAL TOOLS LIST

(1) SMR code	(2) National Stock No.	(3) Description	(4) Unit of measure	(5) Quantity incorporated in unit	(6) 15-day organizational maintenance allowances (a) 1-5	(b) 6-20	(c) 21-50	(d) 51-100	(7) Illustration (a) Figure No.	(b) Item No.
PAOZZ	4925-00-781-6511	FIXTURE, TORQUE (19203 FSCM)	ea	1					3-4	
	4925-00-854-0889	FUZE WRENCH, RKT (98747 FSCM)	ea	1						
	5120-01-089-9960	STRAP WRENCH, WHD (33234 FSCM) (alternate to NSN 5120-00-020-2947)	ea	1						
	5120-00-020-2947	STRAP WRENCH, WHD (1001 FSCM) (alternate to NSN 5120-01-089-9960)	ea	1						

By Order of the Secretary of the Army:

CREIGHTON W. ABRAMS
General, United States Army
Chief of Staff

Official:

VERNE L. BOWERS
Major General, United States Army
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